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China's Developing Environmental Law: Policies, Practices and Legislation

by Bruce L. Ottley*
and Charles C. Valauskas**

I. INTRODUCTION

In July 1979 the People's Republic of China took a major step toward creating a Western style legal system when it enacted seven new laws.¹ Since that time, the Chinese have given increasing attention to the role of law² as a means of regulating conduct. The National People's Congress has adopted subsequent laws, regulations and procedures aimed at establishing a general legal system for the country and regulating foreign investment.³

Amid the rapid developments taking place in Chinese law, American lawyers, scholars and business people have focused most of their attention on the legal aspects of normalization of relations between the United States and China. These aspects include primarily the settlement of outstanding claims, foreign

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1. The seven basic laws adopted by the National People's Congress in July 1979 are: "Organic Law for People's Courts," "Criminal Law," "Criminal Procedure Law," "Organic Law for People's Procurators," "Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment," "Organic Law for the Local Congresses, Governments" and "Electoral Law for the National People's Congress and Local People's Congresses". A translation of these laws can be found in *Daily Report: People's Republic of China*, FOREIGN BROADCAST INFORMATION SERVICE (FBIS-CHI), FBIS-CHI-79-146 Supp. 019, July 27, 1979 and FBIS-CHI-79-147 Supp. 020, July 30, 1979.

2. See Han, *Strengthening China's Socialist Law*, CHINA RECONSTRUCTS, Dec. 1979, at 2; Peng, *Explanation of Seven Laws*, BEIJING REV., July 13, 1979, at 8-16; T. HSIA & K. HAUN, PEKING'S MINISTER OF PUBLIC SECURITY ON STRENGTHENING THE LEGAL SYSTEM (1979) [hereinafter cited as HSIA & HUAN]; and Xie & Xu, *Trends in Chinese Jurisprudence*, BEIJING REV., Apr. 6, 1981, at 14.

3. In September 1980 the National People's Congress enacted four additional laws. See *Nationality Law As Approved*, FBIS-CHI-80-180, Sept. 15, 1980, at L 26; *Marriage Law Adopted by Fifth National People's Congress*, FBIS-CHI-80-184, Sept. 19, 1980, at L 22; *The Income Tax Law of the People's Republic of China Concerning Joint Ventures with Chinese and Foreign Investment, and Individual Income Tax Law of the People's Republic of China*, FBIS-CHI-80-181, Sept. 16, 1980, at L 16, L 19. In addition, the State Council has promulgated a number of regulations relating to foreign investment. For examples, see *Provisional Regulations for Exchange Control of the People's Republic of China*, BEIJING REV., Jan. 26, 1981, at 25; *Interim Regulations Concerning the Control of Resident Offices of Foreign Enterprises*, BEIJING REV., Jan. 26, 1981, at 25; *Interim Regulations Concerning the Control of Resident Offices of Foreign Enterprises*, BEIJING REV., Dec. 15, 1980, at 25; and *Detailed Rules and Regulations for the Implementation of the Income Tax Law of the People's Republic of China Concerning Joint Ventures with Chinese and Foreign Investment*, BEIJING REV., Mar. 30, 1981, at 23.

investment, trade and commercial policy.⁴ With the exceptions of the Law on Joint Ventures⁵ and the Criminal Law,⁶ no comprehensive analysis has been made of the new laws or of the factors that shaped them. The reason for this omission is that legislation played only a minor role in traditional China and the People's Republic prior to 1979.⁷ In addition, the secrecy that surrounds the operation of the Chinese government makes it difficult to determine the processes of legislation.

Although the Chinese are now using written laws as a means of accomplishing their policy goals, an important question remains unanswered about Chinese law and legal institutions: Do the new developments represent a fundamental change in the Chinese methods of implementing policy and resolving disputes, or are they only a temporary expedient? While no definitive answer can yet be given to that question, some suggestions may be drawn from a comparison of the policies and practices of the Chinese prior to 1979 with the goals and methods of the new legislation.

One area which lends itself to such comparison and which, therefore, can provide considerable insight into the development of law in China is environmental protection. In 1979, the People's Republic adopted its first national laws for the protection of the environment: the Forestry Act⁸ and the Law on Environmental Protection.⁹ These laws represent an important change in China's approach to environmental protection. Prior to the enactment of these laws, changes in the country's environmental quality resulted either from attempts by the government to improve public health, to manage the country's resources, to promote economic development or for political purposes.¹⁰ Those policies were pursued through programs based upon Mao Zedong's ideals of simple solutions to problems, mass participation campaigns, self-reliance and political consciousness.¹¹ While those approaches produced a number of notable environmental

4. See Jenkins, *Implications of Recent Agreements for United States-China Trade*, 14 INT'L LAW. 5 (1980); Surrey, *Trade and Economic Relations with the People's Republic of China: Recent Developments*, 14 INT'L LAW. 15 (1980); and George, Gullo & Stein, *Trade with the People's Republic of China: Current Status and Future Prospects*, 3 NW. J. INT'L L. & BUS. 21 (1981).

5. See Torbert & Thomson, *China's Joint Venture Law: A Preliminary Analysis*, 12 VAND. J. TRANSNAT'L L. 819 (1979); Cohen, Huang & Nee, *China's New Joint Venture Law*, in A NEW LOOK AT LEGAL ASPECTS OF DOING BUSINESS WITH CHINA 195 (1979); Hsia & Hahn, *China's Joint Venture Law*, 1 CHINA L. REP. 5 (1980); Reynolds, *The Joint Venture Law of the People's Republic of China: Preliminary Observations*, 14 INT'L LAW. 31 (1980); and Rich, *Joint Ventures in China: the Legal Challenge*, 15 INT'L LAW. 183 (1981).

6. See *Chinese Criminal Code Symposium*, 73 J. CRIM. L. 135 (1982).

7. See V. LI, *LAW WITHOUT LAWYERS* (1978); Stahnke, *The Background and Evolution of Party Policy on the Drafting of Legal Codes in Communist China*, 15 AMER. J. COMP. L. 506 (1967); and Lubman, *Mao and Mediation: Politics and Dispute Resolution in Communist China*, 55 CAL. L. REV. 1284 (1967).

8. *Text of New Forestry Act Recently Adopted by NPC*, Beijing Xinhua, Feb. 26, 1979, as translated in FBIS-CHI-79-043, Mar. 2, 1979, at E 1 [hereinafter cited as Forestry Act].

9. *Text of Law on Environmental Protection*, Beijing Xinhua, Sept. 16, 1979, as translated in FBIS-CHI-79-182, Sept. 18, 1979, at L 1 [hereinafter cited as Law on Environmental Protection].

10. See § III *infra*.

11. See § II.C *infra*.

successes, they paid little attention to, and were unable to deal with, the increasing quantities of pollution produced by a developing industrial sector.

Despite the Chinese government's recognition of the dangers of pollution, their attempt to deal with it by means of written law must be balanced against the demands of the "four modernizations"¹² and the government's emphasis on rapid economic growth. Many of the economic projects that have been proposed or undertaken by the government may conflict with the mandate of the Law on Environmental Protection to prevent further damage to the environment. This will require the Chinese either to choose between the law's goals or to reconcile these goals with the pragmatic policies of the country's new leaders. In doing so, the Chinese also will test their commitment to written law.

It is beyond the scope of this article to review comprehensively every policy, practice and regulation that has affected China's environment since 1949. Accurate and complete historical data are still lacking. Instead, the purposes of this article are fourfold: first, to analyze the social, economic and political influences on China's attitude toward the environment and written law; second, to show how those factors shaped environmental policies and practices prior to the enactment of the Forestry Act and the Law on Environmental Protection; third, to discuss how those attitudes and policies are reflected in the Forestry Act and the Law on Environmental Protection; and finally to indicate the potential effect of the Forestry Act and the Law on Environmental Protection on the protection of China's environment. The authors conclude that the enactment since 1979 of environmental laws and regulations indicates a genuine concern by the Chinese about the dangers of environmental pollution. However, the demands for industrial development and the lack of technology to deal with the pollution it produces, coupled with the lack of an alternative source of energy to coal and the pressures on the natural environment from an expanding population, will reduce the ability of the Chinese to achieve the goals of these laws.

II. CHINESE ATTITUDES TOWARD THE ENVIRONMENT AND LAW

"Marxism, Leninism, Mao Zedon Thought" is the official ideology of the People's Republic of China.¹³ Central to this ideology is the theory that human history is a recurring clash of "contradictions" within the natural world, human

12. The "four modernizations" is a program to modernize agriculture, industry, science and defense in China by the year 2000. The program and goals were first outlined in a speech by then premier Hua Guofeng to the Fifth National People's Congress in February 1978. See Kallgren, *China 1978: The New Long March*, 19 ASIAN SURV. 1, 12-15 (1979) [hereinafter cited as Kallgren].

13. CONSTITUTION OF THE PEOPLE'S REPUBLIC OF CHINA, art. 2 (1978). For a translation of the 1978 Chinese Constitution, see Hsia & Haun, *People's Republic of China*, in IV CONSTITUTIONS OF THE COUNTRIES OF THE WORLD (1982) [hereinafter cited as CONSTITUTIONS]. For commentaries on the 1978 Constitution, see Cohen, *China's Changing Constitution*, 76 CHINA Q. 794 (1978); de Heer, *The 1978 Constitution of the People's Republic of China*, 4 REV. SOC. L. 309 (1978); Kearley & Lim, *The 1978 Constitution of the People's Republic of China*, 2 HASTINGS INT'L & COMP. L. REV. 251 (1979).

society and man's thinking.¹⁴ According to this view, these conflicts produce both unity and struggle and are the compelling forces of movement and change in the world.¹⁵ Although the nature of the contradictions may change after socialism is reached, conflict will continue until the full development of communism is achieved.¹⁶ Thus, in order to understand China's policies, programs and laws since 1949, the role of these contradictions must be recognized.

Among the contradictions that have continued in China since the introduction of socialism is that involving the environment. Although the Chinese attribute environmental problems in capitalist countries to the "antagonistic" conflict between industry and environmental interests, they maintain that such contradictions have been abolished in China.¹⁷ Instead, they place much of the blame for their current environmental problems, as well as for practically everything else, on the "Gang of Four."¹⁸

An examination of the Forestry Act and the Law on Environmental Protection, as well as governmental policies and programs which have affected the environment since 1949, reveals the influence of a complex of social, economic and political attitudes and forces. While the Chinese now classify these attitudes and forces as contradictions "among the people"¹⁹ so as to make them "non-antagonistic," they still remain critical factors in the success or failure of the new environmental laws and the country's current environmental programs. Thus, an analysis of past practices, current laws and future prospects must begin with an examination of Chinese attitudes toward the environment and law.

A. *Man and Nature in China*

Unlike Western thought which has stressed that man, as the center of the world, must constantly strive to conquer nature, traditional Chinese philosophy

14. Mao Zedong first set out his theory of contradictions in 1937 in *On Contradiction*, reprinted in I SELECTED WORKS OF MAO TSE-TUNG 311 (1967). He later refined his views in a 1957 speech entitled *On the Correct Handling of Contradictions Among the People*, reprinted in V SELECTED WORKS OF MAO TSE-TUNG [hereinafter cited as V SELECTED WORKS]. In that speech Mao stated that:

Marxist philosophy holds that the law of the unity of opposites is the fundamental law of the universe. This law operates universally, whether in the natural world, in human society, or in man's thinking. Between the opposites in a contradiction there is at once unity and struggle, and it is this that impels things to move and change. Contradictions exist everywhere, but their nature differs in accordance with the different nature of different things. In any given thing, the unity of opposites is conditional, temporary and transitory, and hence relative, whereas the struggle of opposites is absolute.

Id. at 392.

15. See V SELECTED WORKS, *supra* note 14, at 392-93.

16. *Id.* at 393-95.

17. See Bloche, *China Discovers Health Perils Accompany Modernization*, Washington Post, Aug. 19, 1979, at A21, col. 1.

18. In 1979 Chinese officials told a group of visiting American medical students that "[i]n Shanghai before the Cultural Revolution started there was a mass movement to take out dust from smoke in factories. Scrubbers were installed in 3000 of 6000 smokestacks. . . . Then the Gang of Four ordered them removed." *Id.* at col. 2.

19. The Chinese claim that these "contradictions" are the result of old "habits." *Id.*

emphasizes the necessity of harmony between man and nature.²⁰ Basic to Confucianism is the idea that heaven, earth and all living creatures are part of an ordered and integrated universe.²¹ Man's primary task in this system is to act in a way that maintains the balance between man and nature.²² This view is also reflected in Taoism, which holds that each individual must find his own personal adjustment to the patterns of the natural world and follow the way (tao) of the universe.²³ In part, this is achieved through the realization that the world of man and nature form one indivisible unity and that man is only one element of the entire universe.²⁴

Although Chinese philosophy, art and literature have been sensitive to nature, economic reality has dictated a sharp "contradiction" between theory and practice. Four examples illustrate the extent of the impact man has had on the physical environment of China over the centuries.

First, from the beginning of history, agriculture has been the primary occupation of the Chinese people.²⁵ Despite the labor intensive methods that have been used, the needs of the constantly growing Chinese population have called for even more intensive forms of agriculture on a proportionately small amount of land. The result has been a long process of soil erosion and soil exhaustion which thereby lessens its productivity.²⁶ Even the addition of human waste to the soil has not been able to enrich soil quality without some drawbacks.²⁷ The spreading of human waste on the land has caused surface and ground water pollution and exposed farmers to pathogenic bacteria and viruses.²⁸

Second, Chinese farmers have altered the landscape through reclamation and irrigation projects. For centuries, they have drained lowland areas, controlled streams and built a network of canals for irrigation and drainage.²⁹ Millions of acres of hillsides have been terraced to retain water for wet rice farming and to prevent erosion.³⁰ Hundreds of miles of dikes have also been constructed and maintained to keep lowlands from being flooded.³¹

Third, as early as the eighth century B.C., the Chinese recognized the problem of deforestation.³² Although at one time about half of China was forest covered,

20. Tuan, *Our Treatment of the Environment in Ideal and Actuality*, 58 AM. SCIENTIST 244 (1970) [hereinafter cited as Tuan].

21. H. NAKAMURA, *Ways of Thinking of Eastern Peoples: India-China-Tibet-Japan* 277-84, (1964).

22. *Id.*

23. Dubs, *Taoism*, in CHINA 266-89 (H. NacNair ed. 1946).

24. *See id.*

25. *See* T. TREGAR, CHINA: A GEOGRAPHICAL SURVEY 108 (1980) [hereinafter cited as TREGAR]. Even today more than 80% of the Chinese population is engaged in agriculture. *Id.*

26. *See* Y. TUAN, CHINA 29-37 (1969).

27. *See* note 117 *infra*.

28. *See* note 117 *infra*.

29. *See* TREGAR, *supra* note 25, at 51-57.

30. *Id.*

31. *Id.*

32. *See* Tuan, *supra* note 20, at 248. For American and Chinese views of China's historical policies toward forests, *see* Reidel, *Incredible Journey: A Forester's Perceptions of China*, AM. FOREST, (May 1981), at 22; and Zhu, *China's Great Green Wall*, AM. FOREST, (May 1981), at 24.

now only a small fraction of the country is covered with forests and an even smaller fraction retains its virgin cover.³³ The intense agricultural effort, energy needs and construction have been the primary causes of this problem.³⁴ The results have been severe erosion, declining soil quality, floods and threats to the existence of wildlife.³⁵

Finally, domestic and industrial energy needs have impaired the quality of air in many Chinese cities. Although much of the air pollution is the result of industrialization efforts since 1949,³⁶ the problem is not a new one. Charcoal briquettes have historically been burned for home heating and cooking purposes, thereby producing a constant cloud cover in many of China's larger cities.³⁷

These examples indicate that while the Chinese respect nature in the abstract, economic pressures have created priorities of their own. Not only have these pressures strongly influenced China's policies and programs in the past, they will continue to have a significant impact on the success or failure of future environmental laws and policies.

B. *The Role of Law*

An analysis of the effect that the Forestry Act and Law on Environmental Protection may have on the protection of the environment in China must be based upon the premise that the Chinese concept of written law differs from the Western concept. Unlike Western legal systems, which have based social regulation, dispute settlement and much public policy on statutes, regulations and the decisions of courts, China has historically resorted to written law only for limited purposes or when other methods of social control have failed.³⁸

Before 1911 the Chinese concept of social order was based upon the teachings of Confucius.³⁹ Central to this philosophy was the concept of social harmony based upon ordered relationships and a hierarchy of classes and persons.⁴⁰ Education and the example set by wise leaders provided man with the rules of conduct necessary for the preservation of this equilibrium.⁴¹ As a result, Con-

33. See Tuan, *supra* note 20, at 248. At the present time, only 12.7% of China's total area is covered with forests. See also *Composition of China's Land Resources*, BEIJING REV. Sept. 14, 1981, at 27 [hereinafter cited as *Composition of China's Land Resources*].

34. Tuan, *supra* note 20, 248-49.

35. Alley, *On Trees and Erosion*, EASTERN HORIZON, September 1981, at 10.

36. See Newman, *Environmental Concerns in China*, 15 ENVTL. SCI. & TECH. 741 (1981).

37. The effects of these sulfur clouds were recently felt by a group of American athletes who toured China. See Perry, *The Chinese Fitness Revolution*, RUNNING, Feb. 1982, at 19.

38. See Michael, *The Role of Law in Traditional, Naturalist and Communist China*, 9 CHINA Q. 124 (1962).

39. For a discussion of the teachings of Confucius and their effect on Chinese society, see D. SMITH, *CONFUCIUS* (1974).

40. *Id.* at 70-76.

41. *Id.* at 76-84.

fucianism placed little emphasis on written rules ("fa").⁴² Instead, it stressed social regulation through "li," ethical norms which focused on man's duties based upon his relative position in society rather than on his rights as an individual.⁴³

In conflict with Confucianism was the Legalist School.⁴⁴ According to that view, man is by nature selfish and therefore the only way to preserve social order is to impose order from above.⁴⁵ This school encouraged the ruler to promulgate unyielding written laws and to enforce them strictly with harsh penalties.⁴⁶ Although the Legalist School was briefly in the ascendancy in China,⁴⁷ the harshness of its written laws and punishments resulted in the virtual adoption of Confucianism as the state ideology in traditional China.⁴⁸

The adoption of Confucianism did not mean, however, that written law was nonexistent. The Chinese admitted that under certain circumstances written law was necessary to regulate relations between the individual and the state. Thus, a number of dynastic codes were adopted.⁴⁹ These codes made no distinction between what Western legal systems classify as criminal and civil matters. Instead, they relied upon punishment in order to produce the desired governmental results. Yet, even when the dynastic codes were in force, disputes between individuals which did not affect the state were still resolved according to custom through extralegal organizations such as the family, village or clan.⁵⁰

During the Republican period in China, from 1911 to 1949, the government made attempts to introduce Western concepts of law into China.⁵¹ Although those efforts produced European-style codes and a Western-trained legal profession and judiciary, their influence was limited to the major cities.⁵² The overwhelming majority of the people continued to live their lives according to traditional Confucianist norms.

The victory of the Communist Party in 1949 brought about the abolition of the Guomindang legal system.⁵³ Since the country's new leaders had little knowledge about Western law, their initial efforts to construct a new legal system were

42. See H. KIM, *FUNDAMENTAL LEGAL CONCEPTS OF CHINA AND THE WEST* 2-7 (1981).

43. *Id.* at 17-20.

44. See D. BODDE & C. MORRIS, *LAW IN IMPERIAL CHINA* 23-27 (1967) [hereinafter cited as BODDE & MORRIS].

45. *Id.* at 24.

46. *Id.*

47. The policies of the Legalist School were adopted during the Chin dynasty (221-207 B.C.) which was the first dynasty to unify China. See Ho, *Salient Aspects of China's Heritage*, in *CHINA IN CRISES* 1, 9-11 (P. Ho & T. Tsou eds. 1968).

48. See BODDE & MORRIS, *supra* note 44, at 27-29.

49. The most famous of the dynastic codes was the Ch'ing Code of 1740. See *id.* at 52-75.

50. See J. FAIRBANK, *THE UNITED STATES & CHINA* 122-23 (4th ed. 1979) [hereinafter cited as FAIRBANK].

51. Lee, *Chinese Communist Law: Its Background and Development*, 60 MICH. L. REV. 439, 443-47 (1962).

52. *Id.*

53. The *Directive of the Central Committee of the Chinese Communist Party on the Abolition of the Six-Law Code of the Kuomintang and the Definition of the Principles in Judicial Work of the Liberated Areas* is discussed in Chen, *A Review of Legal Science in New China for Thirty Years*, RESEARCHES ON LAW, Sept. 2, 1980, at 1.

patterned on Soviet models.⁵⁴ Those attempts, however, were brief, and legislation played a limited role in China between 1949 and 1979. In its place was a legal system which possessed many of the same characteristics as that of traditional China.

The first point of similarity between the traditional Chinese legal system and that of the People's Republic during its first thirty years is that social order in both systems was, for the most part, based upon unwritten rules which reflected official norms of behavior. While in traditional China those norms were the Confucian teachings, in the People's Republic they were the political considerations that were reflected in Communist Party policy.⁵⁵ Victor Li has pointed out that in the People's Republic, as in Confucian China, the

[p]roper modes of behavior [were] taught not through written laws but through a lengthy and continuing educational process whereby a person first learn[ed] and then internaliz[ed] the socially accepted values and norms. Compliance [was] obtained not through fear of governmental punishment, but from a genuine understanding and acceptance of the proper rules of conduct.⁵⁶

Second, as in traditional China, the People's Republic recognized that for certain purposes written rules were required. As a result, a number of statutes, regulations and directives were adopted between 1949 and 1979.⁵⁷ Those laws, however, were not the usual method of social regulation. In a 1957 speech, "On the Correct Handling of Contradictions Among the People,"⁵⁸ Mao Zedong stated that written laws were only necessary to resolve conflicts between the "enemy" and the "people."⁵⁹ Thus, the vast majority of the written laws were penal in nature or aimed at "counter-revolutionaries."⁶⁰

Finally, just as relations between individuals that did not affect the government were not subject to written laws in traditional China, "non-antagonistic" conflicts "among the people" in the People's Republic were resolved by neighborhood or workplace committees using education, persuasion and conciliation.⁶¹ Despite statements attributed to Mao Zedong in the early 1960's concern-

54. J. COHEN, *THE CRIMINAL PROCESS IN THE PEOPLE'S REPUBLIC OF CHINA 1949-1963; AN INTRODUCTION* 10-14 (1968) [hereinafter cited as COHEN].

55. For a discussion of the relationship between Communist Party Policy and Law in China, see Hoffheimer, *Law and Modernization in China: The Juridical Behavior of the Chinese Communists*, 7 GA. J. INT'L & COMP. L. 515 (1977); and Lubman, *Form and Function in the Chinese Criminal Process*, 69 COLUM. L. REV. 535, 560-61 (1969).

56. Li, *The Role of Law in Communist China*, 44 CHINA Q. 66, 73 (1970).

57. For a collection of laws enacted by the People's Republic of China between 1949 and 1978, see *SELECTED LEGAL DOCUMENTS OF THE PEOPLE'S REPUBLIC OF CHINA*. (J. Wang ed. Vol. I (1976) and Vol. II (1979)).

58. V *SELECTED WORKS*, *supra* note 14, at 384.

59. *Id.* at 391-92.

60. See COHEN, *supra* note 54, at 9-53.

61. V *SELECTED WORKS*, *supra* note 14, at 393.

ing the need for a formal legal system,⁶² a civil code was never adopted. Instead, when the Cultural Revolution swept China between 1966 and 1976, all thought of codified law was abandoned.

With the conflicts of the Cultural Revolution and the upheavals that followed the death of Mao Zedong now over, China's leaders have concluded that, to prevent future excesses of the type experienced during that decade, to promote rapid economic development and to encourage foreign investment, major changes in the legal system are necessary.⁶³ The result has been the adoption of a number of new laws and regulations since 1979.⁶⁴

In examining environmental protection and the development of environmental legislation in China, it would be unrealistic to look only at what Western legal systems classify as "law," *i.e.*, public law statutes and regulations and judicial decisions in public and private law suits. Not only were there no statutes dealing with environmental protection until 1979,⁶⁵ but Chinese law contained no methods, such as those in common law nuisance actions, to give individuals a remedy against state or collective factories that caused pollution. Instead, the legacy of tradition and the revolutionary climate in the country combined to create alternative methods of implementing public policy and resolving private disputes. Thus, in order to understand those methods and their influence on the Forestry Act and the Law on Environmental Protection, it is necessary to look beyond the role of statutes and focus as well on the ideology that has shaped governmental policies and programs.

C. *Marxism-Leninism-Mao Zedong Thought*

Just as the Chinese attitudes toward the environment and written law have been shaped by a series of "contradictions" within that society, so also has the attitude toward ideology been the subject of considerable debate. Although the preamble to the 1978 Chinese Constitution states that "the revolution and reconstruction" of China "have been won under the guidance of Marxism-Leninism-Mao Zedong Thought,"⁶⁶ that constitution was drafted before Mao

62.

In 1962 Chairman Mao pointed out that not only criminal law but also civil law was necessary; it won't do to have no laws. Criminal and civil laws must be formulated. Not only must laws be formulated. Judicial precedents must also be compiled. In 1963 Chairman Mao also pointed out: we still have not formulated criminal and civil codes. Our experience is still insufficient, but we must also formulate them. He also said that socialist legal work is a new kind of work.

Han, *Smash the Spiritual Shackles — Do a Good Job of Legal Work*, *Jenmin Jih-pao* (People's Daily), Mar. 16, 1978, at 3. An English translation by R. Randle Edwards and Nien-Ju Chao is in the files of the authors.

63. See HSIA & HUAN, *supra* note 2, at 35-62.

64. See notes 1 and 3 *supra* for a list of those laws and examples of the regulations.

65. Although no environmental laws or regulations were adopted in China prior to 1979, pollution control standards based upon Russian standards were in force but rarely enforced. For a collection of those standards, see ENVIRONMENTAL PROTECTION IN THE PEOPLE'S REPUBLIC OF CHINA 115 (S. Swannack-Hunn, K. Boman & P. Heffernan eds. 1979).

66. Preamble to the 1978 Chinese Constitution, as translated in CONSTITUTIONS, *supra* note 13.

Zedong's role in China's recent history was brought into question by the post-Mao leadership. That reassessment culminated in a report adopted by the Central Committee of the Chinese Communist Party in June, 1981.⁶⁷ While the report stopped short of an actual denunciation of Mao, it served to demystify the image of Mao built up since 1949.

Despite the fact that Mao did not enjoy unchallenged supremacy during his lifetime and the uncertain future of "Marxism-Leninism-Mao Zedong Thought," his ideology was an important factor in determining China's policies and programs between 1949 and 1976 and the laws adopted in 1979. The interpretation and application of recent laws reflect Chinese attempts to work out a compromise between the ideology of the past and the pragmatism of the present. Thus, as another element in analyzing the new environmental legislation, it is necessary to consider briefly the views of Marx, Lenin and Mao concerning the environment.

Marx's writings about man's relation to the environment are brief, obscure and often conflicting. Although the early works of Marx spoke of "the essential unity of man and nature,"⁶⁸ his later writings stressed that man is the most important factor in society and nature exists to satisfy man's needs.⁶⁹ He viewed man's transformation of the environment to satisfy those needs as just one factor in the development of society.⁷⁰ Marx, however, did not discuss the negative effects of that transformation. He was more concerned with the effects of the industrial revolution on man than on the environment.

Friedrich Engels' writings about man and the environment are also brief. Like Marx, he felt that man's well-being was of central importance and that the environment was principally a source of wealth to speed the development of the economy.⁷¹ Engels, however, did admit that man's efforts to transform nature for economic reasons often resulted in harmful effects on the environment.⁷² He attributed such harms to man's limited understanding of nature and science and to the evils of capitalism.⁷³

Engels believed that where environmental problems did develop, the harmful effects of man's "interference with the traditional course of nature" could be

67. *Resolutions on Certain Questions in the History of Our Party Since the Founding of the People's Republic of China*, reprinted in BEIJING REV., July 6, 1981, at 10 [hereinafter cited as *Resolution on Certain Questions*]. While the report refers to Mao as "a brilliant revolutionary leader," *id.* at 13, it asserts that he betrayed his own philosophy beginning in the late 1950's by steering China into a series of radical political and economic campaigns that did not work. *Id.* at 15. In particular, the report singles out the Cultural Revolution as "a grave blunder" and states that Mao "was responsible for the most severe setback and heaviest losses suffered by the Party, the state and the people since the founding of the People's Republic." *Id.* at 20.

68. KARL MARX: EARLY WRITINGS 167 (T. Bottomore ed. 1964).

69. See A. MEYER, MARXISM: THE UNITY OF THEORY AND PRACTICE 10 (1970).

70. *Id.*

71. F. ENGELS, DIALECTICS OF NATURE 180-83 (1934).

72. *Id.* at 180.

73. *Id.* at 180, 183.

corrected.⁷⁴ He optimistically wrote that "with every day that passes" man acquires a better knowledge and understanding of the laws of nature and how to apply them.⁷⁵ As for the environmental consequences of capitalism, Engels viewed them as just another argument in favor of a "revolution in our whole contemporary social order."⁷⁶

Lenin's attitude towards the environment was influenced by Marxism and by the pre-revolutionary debate in Russia over man and nature.⁷⁷ In this debate, the emerging capitalists stressed the development of heavy industry and the transformation of Russia into an industrial society.⁷⁸ They gave little thought to the environment except in relation to its contribution to the nation's economy.⁷⁹ In contrast to these capitalist sentiments, most of the peasants and some intellectuals viewed capitalism as a threat to their idealized concept of the unity of man and nature.⁸⁰ These "populists" stressed "the advantages of backwardness" and sought to preserve the natural state of the environment.⁸¹

After the Russian revolution, Lenin rejected the "populist" views and chose the path of heavy industrialization as the means of transforming Russia into an industrial society.⁸² Environmental protection took second place to the needs of rapid development. The victory of the revolution also created the idea of the nobility of struggle against tremendous odds. If a few people could make a social revolution, they could also physically transform their surrounding environment. Thus, nature was viewed as just another obstacle to be conquered and transformed by man.⁸³

In recent years communist leaders in the Soviet Union have taken the view that nature is simply a source of raw materials which can be exploited to permit nearly unlimited growth for man's benefit.⁸⁴ The environmental damage that results from such exploitation is either ignored or seen as a temporary problem that can be overcome without affecting development.⁸⁵ This is the primary reason for many of the Soviet Union's severe pollution problems.⁸⁶

Although Mao Zedong considered himself a Marxist, his "Thought" has its

74. *Id.* at 180.

75. *Id.*

76. *Id.* at 182.

77. See D. KELLEY, K. STUNKEL & R. WESCOTT, *THE ECONOMIC SUPERPOWERS AND THE ENVIRONMENT* 22-23 (1976) [hereinafter cited as KELLEY, STUNKEL & WESCOTT].

78. *Id.* at 22.

79. *Id.*

80. See Meisner, *Leninism and Maoism: Some Populist Perspectives in Marxism-Leninism in China*, 45 CHINA Q. 2, 4-9 (1971) [hereinafter cited as Meisner].

81. *Id.*

82. *Id.* at 9-15.

83. *Id.*

84. One example of this is the Soviet attitude toward energy consumption. See KELLEY, STUNKEL & WESCOTT, *supra* note 77, at 52-56.

85. See note 225 *infra*.

86. The most serious criticism of recent Soviet environmental policies is contained in B. KOMAROV, *THE DESTRUCTION OF NATURE IN THE SOVIET UNION* (1980).

origins not in the philosophy of the nineteenth century but in the political and economic struggles that the Chinese communists faced from the 1920's until 1949. As a result of these experiences, Mao developed a number of principles which, while not specifically aimed at environmental matters, played a critical role in the formation of policies that have affected the environment.

1. Populism

The first characteristic of "Mao Zedong Thought" is a strong belief in the masses. Beginning in the middle of the 1920's, Mao's revolutionary outlook took on a strong rural orientation as his studies of peasant conditions led him to an almost mystical belief in their wisdom and power as a revolutionary force.⁸⁷ While Marx and Lenin considered the peasants to be an important factor in the revolution, they did not view them as an independent revolutionary force. Instead, they placed their emphasis on the urban proletariat as the vanguard of the revolution.⁸⁸ However, with only a small percentage of the Chinese population residing in urban areas and with less than one percent of China's population engaged in industrial activity, Mao turned to the rural peasants. His belief in them was reinforced during the Jiangai and Yanan periods and during World War II when a lack of capital, resources and outside aid forced the communists to seek support among the local peasant populations.⁸⁹

The result of Mao's populism was an overwhelming emphasis on the importance of man. "Of all things in the world, people are the most precious. . . . as long as there are people, every kind of miracle can be performed."⁹⁰ This, in turn, produced an obsession in Mao with human willpower as the force that could move mountains and overcome all obstacles. Men, he repeatedly stated, are more important in winning battles than machines, weapons, experts and technology.⁹¹ Finally, Mao's populism was characterized by a distrust of bureaucrats, intellectuals and other elite groups.⁹² It led him to seek simple common sense solutions to complex problems.

2. Mass Participation

An outgrowth of Mao's populism was his belief that the power of the masses could produce change even more quickly if properly motivated, mobilized and

87. The turning point in Mao's attitude toward the peasantry was a tour he made of vic counties in Hunan Province in 1927. See Mao, *Report of an Investigation into the Peasant Movement in Hunan*, in I SELECTED WORKS OF MAO TSE-TUNG 23 (1967).

88. For a discussion of the contrast between Mao's view of the role of the peasantry in the revolutionary process and that of Marx and Lenin, see FAIRBANK, *supra* note 50, at 287-89.

89. See E. SNOW, *RED STAR OVER CHINA* 210-44. (rev. ed. 1978) [hereinafter cited as SNOW].

90. Mao, *The Bankruptcy of the Idealist Conception of History*, reprinted in IV SELECTED WORKS OF MAO TSE-TUNG 451, 454 (1969).

91. See Mao, *On Protracted War*, reprinted in II SELECTED WORKS OF MAO TSE-TUNG 113 (1967).

92. For a discussion of Mao's attitude toward bureaucracies, see A. BARNETT, *UNCERTAIN PASSAGE: CHINA'S TRANSITION TO THE POST-MAO ERA* 11-15 (1974) [hereinafter cited as BARNETT].

educated.⁹³ This led Mao to emphasize mass participation campaigns rather than technology or bureaucratic institutions as the means of solving China's problems.

The reasons for Mao's belief in mass participation campaigns were both political and economic. Politically, Mao viewed such campaigns as the most effective way to revolutionize society and build a "new communist man" who would possess tremendous energy and a consciousness that would enable him to conquer all obstacles.⁹⁴ Economically, mass participation campaigns were also a recognition of the reality that China possesses far more people than capital or technology.

3. Politics in Command

Mao Zedong emphasized the politicalization of nearly every aspect of life. His doctrine of "putting politics in command" reflected the importance he placed on political objectives over economic considerations.⁹⁵ Again, this policy had both political and economic purposes. Politically, Mao believed that the success of any mass participation campaign depended upon the people understanding the political and social consequences of their actions.⁹⁶ Economically, it was an expression of Mao's distrust of monetary incentives and his belief that people should be motivated by ideological considerations rather than the desire for personal gain.⁹⁷

4. Self-Reliance

Throughout the period from 1929, when Mao proclaimed his first soviet in Jiangsi Province,⁹⁸ through the Yanan period,⁹⁹ the Chinese communists oper-

93. See Mao, *A Talk to the Editorial Staff of the Shansi-Suiyuan Daily*, reprinted in IV SELECTED WORKS OF MAO TSE-TUNG 241 (1969).

94. See Cheng, *The Economic Thought of Mao Tse-Tung*, 2 ASIAN THOUGHT & SOC'Y 104, 107 (1977). This attitude is best illustrated by one of Mao's essays, a retelling of an ancient Chinese fable *The Foolish Old Man Who Removed the Mountains*, reprinted in III SELECTED WORKS OF MAO TSE-TUNG 271 (1967). The story tells of an old man whose doorway was blocked by two enormous mountains. He led his sons in digging up the mountains with their hoes and, when criticized for his foolishness in doing so, replied: "When I die, my sons will carry on; when they die, there will be my grandsons, and then their sons and grandsons, and so on to infinity. High as they are, the mountains cannot grow any higher and with every bit we dig, they will be much lower. Why can't we clear them away?" Although this story was used by Mao to illustrate his belief that, despite traditional beliefs, man can overcome any obstacle, the story also reveals a conflict between the Confucian and Taoist concern for the harmony of man and nature and Mao's belief that, given the right revolutionary attitude, man can conquer even nature.

95. One example of the importance Mao placed on political considerations was his emphasis on "redness," or ideological dedication and purity, over "expertness, or technical skills." See BARNETT, *supra* note 92, at 154-59.

96. See S. SCHRAM, MAO TSE-TUNG 257-58 (1966).

97. See BARNETT, *supra* note 92, at 14-15.

98. For a description of the establishment of the first soviet in Kiangsi Province in 1929, see SNOW, *supra* note 89, at 162-63.

99. Following the "Long March" of 1934-35, Mao Zedong and the Chinese Communist Party established their headquarters in the isolated mountains of Yanan Province. For a description of the Yanan period, which lasted from 1935 until the victory of the Communist Party in 1949, see SNOW,

ated from the isolated regions of the country.¹⁰⁰ While this offered them protection against the attacks of the Guomindang, the poverty and isolation of the regions forced the communists to seek ways of supporting themselves without alienating the local populations.¹⁰¹

As developed by Mao, the concept of self-reliance grew out of his populism, his belief in mass participation campaigns, and his doctrine of "putting politics in command." It represented a middle position between those who argued for complete self-sufficiency, rejecting anything foreign, no matter how useful and available, and those who were overly dependent on foreign technology and products.¹⁰² The concept of self-reliance forged by Mao during the Jiangsi, Yanan and World War II periods encouraged local enterprises to use their own methods first and foreign ideas and products only when necessary.¹⁰³

As the above set of principles indicates, Mao Zedong Thought was less an ideology with specific goals to implement than it was a political philosophy consisting of specific ideas about *how* to do whatever was to be done. To Mao Zedong the methods of achieving goals were as important, if not more important, as the goals themselves. As the following two sections demonstrate, this emphasis on methods rather than goals had a great impact both on policies that affected the environment and on the programs designed to implement them.

III. THE ENVIRONMENTAL CONSEQUENCES OF CHINA'S POLICIES AND PROGRAMS: 1949-1979

The victory of the Communist Party in China produced fundamental changes in environmental conditions throughout the country during the 1950's and early 1960's. While there were marked improvements both in the natural environment and in the living conditions of the people, there was also serious damage. This was because China had no environmental laws or specific environmental policy. China did not even mention the need for environmental protection until the Cultural Revolution.¹⁰⁴ Instead, the country's new leaders emphasized "a far

supra note 89. The entire book is a description of Snow's visit to Yanan and his interviews with Mao and the other Communist officials.

100. *See id.*

101. *Id.* at 246-61.

102. *See* Mao, *We Must Learn to Do Economic Work*, reprinted in III SELECTED WORKS OF MAO TSE-TUNG 189 (1967).

103. *See* SNOW, *supra* note 89, at 252-56.

104. The Cultural Revolution was a nationwide campaign inspired by Mao Zedong to drastically change many of China's social, economic, and political policies and programs. The first three years of the revolution were marked by a complete upheaval in all of China's institutions. The remaining time until the death of Mao in 1976 saw attempts to implement the populist concepts advocated by Mao. *See generally* ASIA RESEARCH CENTRE, *THE GREAT CULTURAL REVOLUTION IN CHINA* (1967); L. DITTMAR, *LIU SHAO-CH'1 AND THE CHINESE CULTURAL REVOLUTION: THE POLITICS OF MASS CRITICISM* (1974). In recent years many of the policies adopted during the Cultural Revolution have come under criticism by the

reaching revolution that would establish a new political system, alter the basic character of Chinese society, develop the economy and create a strong, modern, socialist nation."¹⁰⁵ Consistent with this goal and with the attitudes discussed in the previous section, the state of the environment was determined by a series of policies that were undertaken by the Chinese government to carry out the social, economic and political aims of the revolution and were implemented through programs based upon Mao Zedong's political philosophy.

The Cultural Revolution represented a watershed in China's attitude and policies toward the environment. For the first time, the government explicitly recognized industrial pollution as a serious international problem accompanying economic development¹⁰⁶ and a domestic political issue¹⁰⁷ and instituted a series of model projects designed to deal with it.¹⁰⁸ In the process, the ideology of Mao Zedong was again used as the basis of the government's programs. With the death of Mao Zedong in 1976 and the introduction of new economic policies by his successors, new forms of pollution arose which could not be solved by model projects or by Mao's political methods.¹⁰⁹ The result was pressure to introduce new means of environmental protection, which culminated in the adoption of legislation of 1979.

It is the purpose of this section to review briefly three of the more significant of China's policies and programs that affected the state of the environment between 1949 and 1979. The authors discuss how the Chinese government implemented public policy decisions without relying on written laws and, second, how the attitudes discussed in the previous section shaped governmental programs.

Chinese and as a result have been altered or dropped entirely. See Harding, *Reappraising the Cultural Revolution*, 4 WILSON Q. 132 (Autumn 1980).

105. BARNETT, *supra* note 92, at 2.

106. *China's Stand on the Question of Human Environment*, PEKING REV., June 16, 1972, at 5. Environmental pollution provided the Chinese with a convenient issue with which to criticize capitalist countries. This was demonstrated by the statements of the Chinese delegation to the First United Nations Conference on the Human Environment held in Stockholm in 1972. At the conference, a speech delivered by the leader of the Chinese delegation blamed the rapid decrease in worldwide environmental quality on aggressive imperialism and the interference of the world superpowers in the affairs of developing countries. *Id.* China also used the pollution issue to strengthen its claim to leadership of the developing world. China pointed to itself as a model alternative society which had been able to make significant economic advances while avoiding the "twin capitalistic monsters" of overurbanization and pollution. K. H. FAN AND K. T. FAN, *FROM THE OTHER SIDE OF THE RIVER* 277-79 (1975).

107. See Orleans & Suttmeier, *The Mao Ethic and Environmental Quality*, 170 SCIENCE 1173, 1173 (1970) [hereinafter cited as Orleans & Suttmeier].

108. Myers, *China's Approach to Environmental Conservation*, 5 ENV'T'L. AFFAIRS 33, 40 (1976) [hereinafter cited as Myers].

109. Noise pollution has become a serious problem in China, with some of the country's major cities experiencing higher noise levels than comparable cities in developed countries. See *Control of Noise Pollution Urged*, BEIJING REV., Apr. 13, 1979, at 28 [hereinafter cited as *Control of Noise Pollution Urged*].

A. Public Health and Sanitation

Prior to 1949 China was characterized as the "sick man of Asia."¹¹⁰ Every known nutritional and infectious disease was present in epidemic proportions.¹¹¹ Medical personnel and facilities were inadequate to meet the expanding population's needs.¹¹² This shortage was exacerbated by the fact that what limited resources were available were concentrated in major urban areas and were thus unavailable to the vast majority of the people.¹¹³

After 1949 the Chinese government gave high priority to improving health care.¹¹⁴ New hospitals were built and more medical workers were trained.¹¹⁵ However, for economic reasons and due to the scarcity of medical resources, the government chose to emphasize preventive techniques over curative methods.¹¹⁶ The result was the initiation of a series of "Patriotic Health Movements" that were aimed at specific health and sanitation problems.¹¹⁷

The approach taken by the "Patriotic Health Movements" was the same as the mass participation campaigns used by the government to deal with other problems; that is, the particular issue was politicized.¹¹⁸ This method drew upon the Party's experience in the pre-1949 Soviet regions and relied on no single governmental department or unit to handle the task alone. Instead, the entire

110. See Sidel, *Health Service in the People's Republic of China*, in *MEDICINE AND SOCIETY IN CHINA* 104 (J. Bowers & E. Purcell eds. 1974).

111. See Smith, *Public Health in China*, 46 *BRIT. J. MED.* 492 (1974) [hereinafter cited as Smith].

112. See Shipp, *To Serve the People: Medical Education and Care in the People's Republic of China*, 97 *ANNALS INT'L MED.* 277 (1982).

113. *Id.*

114. See V. SIDEL & R. SIDEL, *SERVE THE PEOPLE* 21-28 (1973).

115. The most famous of the medical workers trained by the Chinese after 1949 were the "barefoot doctors." See Li, *Politics and Health Care in China: the Barefoot Doctors*, 27 *STAN. L. REV.* 827 (1975); W. BURCHETT & R. ALLEY, *CHINA: THE QUALITY OF LIFE* 227-30 (1976) [hereinafter cited as BURCHETT & ALLEY].

116. In the early 1950's four precepts formed the basis of the health care programs in China. They were: (1) medicine must serve the working people; (2) preventative medicine must be given priority over curative medicine; (3) practitioners of Chinese traditional medicines (zhongyi) must be united with practitioners of Western medicine (xiyi); and (4) health work must be integrated with mass movements. See V. Sidel and R. Sidel, *Health Care Services As Part of China's Revolution and Development*, in *CHINA'S ROAD TO DEVELOPMENT* 155-66 (N. Maxwell ed. 2d ed. 1979) [hereinafter cited as *CHINA'S ROAD TO DEVELOPMENT*].

117. One of the specific health programs targetted by the Patriotic Health Movements was the parasitic disease schistosomiasis. See Courrier & Eckholm, *Schistosomiasis: The Curious Bond Between Snails, People and Disease*, *SIERRA*, Nov.-Dec. 1977, at 11 [hereinafter cited as Courrier & Eckholm]. China historically has been plagued by this disease because of improper management of human waste. See Watt, *Study of the Economics of the Intermediate Host Schistosoma japonicum in Kutangm Chekiang 1934-35*, 1 *CHINESE MED. J.* 434 (1936); Hsu & Hsu, *Schistosomiasis in the Shanghai Area*, in U.S. DEPT OF HEALTH, *EDUCATION AND WELFARE, CHINA MEDICINE AS WE SAW IT* 234 (1974); and Kang & Kang, *Incidence of Schistosomiasis japonica in the Endemic Area in Chekiang*, 1 *CHINESE MED. J.* 449 (1936). As with portions of the Patriotic Health Movements, the schistosomiasis eradication program was preventative rather than curative. See Courrier & Eckholm, *supra*, at 13.

118. See E. DIMOND, *MORE THAN HERBS AND ACUPUNCTURE* 132-35 (1975) [hereinafter cited as DIMOND].

Chinese citizenry was mobilized.¹¹⁹ All types of educational media were utilized to direct the public's attention to the problem.¹²⁰ In order to assure the greatest support from the public, strong connections were made by the media between solving the problem and furthering patriotism, politics and even national security.¹²¹

The claim that poor sanitation threatened national security may, in fact, have provided the greatest impetus to the national sanitation drives of the 1950's. Chinese authorities at the time distributed the message that the United States intended to use biological warfare against the country.¹²² Such a statement must be viewed in light of the country's earlier experience with biological warfare. Documents recently obtained under the Freedom of Information Act¹²³ indicate that China was the target of a biological warfare program directed by the Japanese military from the 1930's until the end of World War II.¹²⁴ During that period the Japanese used planes to drop plague-infested rats, fleas, grains of wheat and rice, pieces of paper and cotton wadding on selected Chinese cities thereby capitalizing on the areas' already unsanitary conditions.¹²⁵ At the end of World War II, the United States captured individuals and secured records from Japan's biological warfare program.¹²⁶ Together, this information would have been sufficient to allow the United States to carry out similar efforts against the Chinese.¹²⁷ To combat that possibility, the Chinese government during the Korean War urged a full-scale mobilization of the public to eliminate all animals, stagnant ponds, litter and other sources of waste that might have aided in the spread of deleterious biological agents.¹²⁸ As a result, while a threat to national security was reduced, public health objectives directly benefited from these efforts. In addition, environmental quality, which was not even a consideration at the time, also benefited.

The program to eliminate disease vectors did not end with the truce in the Korean War, but continued with the public health campaigns to eradicate the "four pests."¹²⁹ The four pests originally targeted for elimination were flies,

119. *Id.*

120. *Id.* at 130-31.

121. *Id.* at 132, 135.

122. *Id.* at 139.

123. 5 U.S.C. § 552 (1967).

124. See Gomer, Powell & Poling, *Japan's Biological Weapons: 1930-1945*, BULL. OF ATOMIC SCIENTISTS, Oct. 1981, at 43; and Powell, *A Hidden Chapter in History*, BULL. OF ATOMIC SCIENTISTS, Oct. 1981, at 44 [hereinafter cited as POWELL].

125. The program has been termed "public health in reverse." See Powell, *supra* note 124, at 44.

126. *Id.*

127. During the Korean War, China accused the United States of employing updated versions of Japan's earlier biological warfare tactics. *Id.* at 48.

128. See DIMOND, *supra* note 118, at 132, 135.

129. See Smith, *supra* note 111, at 492.

mosquitoes, rats and sparrows. These pests were chosen because of the ability to act as disease carriers or as crop destructive agents.¹³⁰

Mass participation campaigns were again used to involve virtually everyone in the country.¹³¹ Widespread efforts were made to educate the people about the pest problem.¹³² It was felt that once the peasantry understood the nature of their enemies, they would then be able to work out their own methods of dealing with them.¹³³ "Putting politics in command" was the key as the people were urged to act on moral incentives alone. Labor intensive methods were used to carry out the work thereby avoiding the need for expensive and scarce chemicals and insecticides. Although the actual methods chosen to eradicate the pests varied, they were characteristically unsophisticated.¹³⁴

The eradication campaigns created a high degree of public excitement with neighborhoods vying with each other for the public honor of being the most diligent in their elimination work.¹³⁵ Overall, the programs did manage to achieve surprising results. Some pest forms, such as the common housefly, are nearly nonexistent today.¹³⁶ While public health directly benefited from these efforts, environmental quality also benefited by the elimination of unsanitary areas.

Despite the notable objectives and accomplishments of the Patriotic Health Campaigns, not all programs were entirely well-conceived. The program to

130. For a discussion of the past control program, see Orleans, *China's Environomics: Backing into Ecological Leadership*, 1 ENVTL. POL'Y & L. 189, 189 (1975) [hereinafter cited as Orleans].

131. See R. HORN, *AWAY WITH ALL PESTS: AN ENGLISH SURGEON IN THE PEOPLE'S REPUBLIC* 89-90 (1969).

132. See DIMOND, *supra* note 118, at 130-131.

133. *Id.*

134. To eliminate flies, for example, the public was directed to kill them in their larval or pupal stage by digging up their breeding areas, locating them and feeding them to ducks or just suffocating them by piling soil on known infested areas. Adult flies were eliminated by swatting them, spraying plant-derived insecticide on them or smoking them out by burning weeds. Mosquitoes were killed by adding certain crushed toxic plants to stagnant water, filling in lowland areas, capturing the adults with nets or smoking them out with a combination of camphor leaves, rice husks or other readily available plants. Rats were eradicated by trapping them or smoking them out. Sparrows were driven away by having people shout, whistle and beat pans in the streets, yards or buildings. See S. SHAPIRO, *AN AMERICAN IN CHINA* 154 (1979) [hereinafter cited as SHAPIRO] and PUBLIC HEALTH SERVICE, NAT'L INST. OF HEALTH, U.S. DEP'T OF HEALTH, EDUCATION AND WELFARE, *A BAREFOOT DOCTOR'S MANUAL* [hereinafter cited as *A BAREFOOT DOCTOR'S MANUAL*].

135. See DIMOND, *supra* note 118, at 135.

136. See Smith, *supra* note 11, at 492. Despite the criticism that some aspects of China's public health campaigns have received in the United States and other countries, such campaigns are not totally alien to developed countries. In the United States, for example, public health officials launched their own anti-fly efforts in the early 1900's which were identical to the Chinese campaigns. Health officials made use of the popular media to alert the public to the health dangers presented by the fly and to outline methods to eliminate them. In addition to preventive measures to control flies, media attention was devoted to the results of "swat the fly" campaigns to eliminate "public enemy number one." In Washington D.C., for example, a campaign in 1912 reported that 5000 boys and girls killed almost 350,000 flies in a short period of time. See McClary, *Swat the Fly: Popular Magazines and the Anti-Fly Campaign*, 11 PREVENTIVE MED. 373 (1982).

eradicate sparrows, for example, was carried out with such patriotic fervor that not only sparrows were eliminated from wide areas of the country but also almost all other kinds of birds.¹³⁷ This, in turn, allowed more destructive life forms which normally would have been controlled by the birds to rapidly increase in numbers, thereby causing new problems.¹³⁸

The effectiveness of most of the public health campaigns was hampered by the fact that immediate solutions were not found to manage the country's untreated sewage and to prevent its entry into bodies of water.¹³⁹ Inadequate waste collection and management systems existed before 1949.¹⁴⁰ Waste, for the most part, was indiscriminately allowed to collect on the outskirts of villages in rural areas or was thrown into waterways.¹⁴¹ In urban areas, waste was collected by unsophisticated pipe systems or carried by buckets to areas around the city where it was dumped onto the fields as fertilizer.¹⁴² Such disposal methods encouraged the spread of fecal borne disease, contaminated water supplies and attracted pests to these unsanitary areas. This waste problem presented a particular problem in China because more sophisticated, western-style collection and waste treatment facilities required large expenditures of scarce capital to build or purchase.

One simple solution was to forbid promiscuous defecation and urination and to collect and store urine and feces in stoneware crocks or pits.¹⁴³ The collected waste was then held for a certain period of time, two weeks during the summer and four weeks during the winter.¹⁴⁴ In this way, the organic portion of the waste was allowed to decompose, thereby liberating sufficient quantities of heat to kill bacteria, parasitic ova and other disease agents.¹⁴⁵

Beyond preventing the spread of fecal borne disease there were a number of other benefits to this control method. For example, it was found that the joint decomposition of various organic wastes produced a high quality fertilizer.¹⁴⁶ After removal from the digesters, such organic fertilizer could be spread onto the fields without the disease and pest problems associated with untreated waste.¹⁴⁷ An additional benefit was that actual decomposition process generated sizable quantities of methane gas which, if stored, could be used as an alternative

137. See Myers, *China's Wildlife*, NAT'L PARKS & CONSERVATION MAG., Sept. 1979, at 13.

138. See *id.*, SHAPIRO, *supra* note 134, at 154-55.

139. Improper management of human waste facilitated the transmission of parasitic disease. See Robertson, *The Transmission in China of Helminths by Vegetables*, 1 CHINESE MED. J. 418, 418 (1936).

140. See Orleans & Suttmeier, *supra* note 107, at 1174.

141. See Orleans, *supra* note 130, at 190.

142. *Id.*

143. See A BAREFOOT DOCTOR'S MANUAL, *supra* note 134, at 37.

144. *Id.*

145. See Qu, *Protecting the Environment*, CHINA RECONSTRUCTS, Feb. 1980, at 30 [hereinafter cited as Qu].

146. See Smil, *Energy Solution in China*, ENVIRONMENT, Oct. 1977, at 27, 30 [hereinafter cited as Smil].

147. *Id.*

source of energy for domestic cooking, heating and lighting.¹⁴⁸ It was this last benefit which brought about the eventual widespread production of biogas digesters that were specifically designed to accept organic wastes for the production of energy.¹⁴⁹

B. Resource Management

China's approach to resource management dates back to the 1930's when the Communist Party sought to maintain a viable local economy in areas under their control despite the Guomindang blockades.¹⁵⁰ As discussed earlier, frugality and self-reliance were a necessity and were expressed by the creative recovery and reuse of materials.¹⁵¹ Because of the experience and success the Party had with these early efforts, the same methods were adopted by the government on a nationwide scale after 1949.¹⁵² Mao Zedong called upon everyone to avoid waste. "Every co-operative, every shop, every office, every school and every military unit must seriously conduct its own antiwastefulness campaign and will continue to do so once every year."¹⁵³ All materials formerly labeled as wastes were reevaluated for their potential reuse in the Chinese economy.¹⁵⁴ Two examples illustrate this policy and its effect on the environment.

Prior to 1949 domestic garbage went uncollected and untreated and provided a breeding ground for pests and disease.¹⁵⁵ With the establishment of city services after 1949 and the focus of the Patriotic Health Campaigns on the removal of garbage, it no longer presented the sanitation problems it once did. However, for economic reasons, the garbage was not disposed of in a summary fashion. Instead, anything of value was separated out for reuse.¹⁵⁶ These segregated quantities of material represented the hidden benefit in the garbage in much the same way that the organic fertilizer and methane gas represented the hidden value in waste. Ideologically, the recycling of garbage served Mao's principle of self-reliance since it lessened the need to exploit more traditional sources of raw materials.¹⁵⁷ This utilization effort went as far as taking the

148. See Tai, *Home-Made Gas for China's Countryside*, CHINA RECONSTRUCTS, May 1977, at 77; *Popularizing Use of Methane in Rural Areas*, BEIJING REV., July 20, 1979, at 5 [hereinafter cited as *Popularizing Use of Methane*].

149. By 1978 thirty-five million people were said to be using waste methane as their primary source of energy. See *Popularizing Use of Methane*, *supra* note 148. See also the estimates of use in Smil, *supra* note 146, at 28; *China Pioneers Marsh Gas*, ASIaweek, June 20, 1980, at 64.

150. See SNOW, *supra* note 89, at 252-56.

151. See § II.C. 4 *supra*.

152. See Kapp, *Recycling in Contemporary China*, 27 WORLD DEV. 565, 569 [hereinafter cited as Kapp].

153. MAO PAPERS 61 (J. Chen ed. 1970).

154. See Orleans & Suttmeier, *supra* note 107, at 1175.

155. *Id.*

156. *Id.*

157. For a discussion of the economic value of the waste utilization program in China, see James, *Growth, Technology and the Environment in Less Developed Countries: A Survey*, 6 WORLD DEV. 956 (1978).

remaining portion of garbage and converting it into compost so that it could be used for fertilizer. Overall, this effort was aided by the fact that Chinese garbage at that time was more organic in nature without the plastics, bottles and metal containers typical of developed countries' throwaway economies.¹⁵⁸

Agriculture in China has traditionally been based upon the full use of resources, as well as waste and sewage.¹⁵⁹ Urban areas for years disposed of their sewage by transporting it to surrounding rural areas and dumping it on the fields.¹⁶⁰ This method of disposal was convenient for the cities since it removed the necessity of having to build costly collection and treatment systems. Rural economies also benefited from this practice since urban waste was a form of indirect aid which increased production efficiency on the farms.¹⁶¹ This reliance continued after 1949 so that when the call went out to increase agricultural production, the application of organic waste was increased with an additional complementary sowing of nitrogenous crops plus spreading organic-rich sediments from lakes and waterways on fields.¹⁶² In fact, it was not until 1956 that the first phosphate fertilizer plant was built with Russian help in Nanking and not until 1958 that a rural fertilizer industry was started.¹⁶³

The use of organic wastes and sewage as fertilizer on farms also had political and economic benefits. Politically, it was consistent with Mao's emphasis on self-reliance. Economically, it utilized a resource which might otherwise have been haphazardly discarded and eliminated the need for less energy efficient but more expensive chemical fertilizers. Thus, the use of organic wastes on China's farms represented the essence of the policy of "turning the harmful into the beneficial."

By attempting to improve public health conditions and manage the country's resources, the Chinese found solutions that not only accomplished their primary political and economic objectives but also had the unforeseen benefit of improving the physical environment. As will be seen, however, other governmental policies produced unforeseen and unintended harms to the environment.

C. *Economic Development*

A third program which affected China's environmental quality between 1949 and 1979 was the drive to develop the country's economy. Although the ultimate goal of that drive was to improve the lives of the people, not all of the results were beneficial to the people or to the physical environment. The principal

158. See Orleans & Suttmeier, *supra* note 107, at 1176.

159. See Wortman, *Agriculture in China*, SCI. AM., June 1975, at 13, 18-19 [hereinafter cited as Wortman]; Sprague, *Agriculture in China*, 188 SCIENCE 549, 552 (1975).

160. See Kapp, *supra* note 152, at 566.

161. See *id.*

162. See Wortman, *supra* note 159, at 18-19.

163. See K. BROADBENT, *AGRICULTURE, ENVIRONMENT AND CURRENT POLICY IN CHINA* 416 (1980).

reason for this was the dramatic swings which frequently occurred in economic policy.

In 1949 the new Chinese government inherited an economy fragmented by years of civil war and the war with Japan.¹⁶⁴ The first objective of the new government was economic construction.¹⁶⁵ Although most of the new leaders had experience operating rural and agriculturally-based economies,¹⁶⁶ they had little knowledge about industry and industrial planning on a national scale.¹⁶⁷ As a result, they turned to the Soviet Union not only for financial assistance but also for technical guidance.¹⁶⁸ It was largely because of this influence that the first Five Year Plan (1952-1957) was adopted.¹⁶⁹

The first Five Year Plan was characterized by a Soviet-style emphasis on rapid industrialization.¹⁷⁰ Top priority was given to heavy industry and the production of industrial raw materials. Although the plan was highly successful in achieving industrialization and overall growth,¹⁷¹ it paid no attention to the resulting air and water pollution. The government had no inspection service and exercised no control over industrial pollution. Instead, the smoke that poured from the factories and mills was equated with progress.

The emphasis of the first Five Year Plan on urban industrial development rather than on agricultural had other environmental effects as well. It resulted in a sharp increase in urban migration at a time when peace was producing a rapid population increase.¹⁷² In addition to the effects of the loss of manpower suffered by agriculture, it also produced widespread urban unemployment since most of the industrial projects relied on skilled workers and foreign advisors to operate the sophisticated machinery.¹⁷³ The large increase in urban population also severely taxed the already inadequate public services available in the cities.¹⁷⁴

164. See B. BRUGGER, CHINA: LIBERATION AND TRANSFORMATION: 1949-1962 17-49 (1978) [hereinafter cited as BRUGGER]. The civil war was fought by the Guomindang (Nationalist Party) forces of Jiang Jieshi (Chiang K'ai-shek) and the Communist Party guerilla movement of Mao Zedong. *Id.* at 23-28. The Japanese invasion of China in 1937 and the following war alienated much of the Guomindang support due to their inability to deal with these foreign forces. *Id.*

165. See N. CHEN & W. GALENSON, THE CHINESE ECONOMY UNDER COMMUNISM 50 (1969) [hereinafter cited as CHEN & GALENSON].

166. See A. WATSON, MAO ZEDONG AND THE POLITICAL ECONOMY OF THE BORDER REGION 1-55 (1980); Berger, *Self-Reliance, Past and Present*, EASTERN HORIZON, Fall 1980, at 8 [hereinafter cited as Berger]; and SNOW, *supra* note 89, at 210-61.

167. See SNOW, *supra* note 89, at 210-61.

168. For a discussion of the Soviet economic model and its influence on China, see J. CHESNEAUX, CHINA: THE PEOPLE'S REPUBLIC, 1949-1976 56-82 (1979) [hereinafter cited as CHESNEAUX].

169. See Berger, *supra* note 166, at 169-70.

170. See CHESNEAUX, *supra* note 168, at 57-60.

171. See *id.* at 59.

172. Population figures for urban and rural areas are found in Thompson, *City Planning in China*, in CHINA'S ROAD TO DEVELOPMENT, *supra* note 116, at 300 and Table 1.

173. For a discussion of the rural migration to the cities during the 1950's and the resulting unemployment, see M. MEISNER, MAO'S CHINA: A HISTORY OF THE PEOPLE'S REPUBLIC 218-20 (1977).

174. *Id.*

The social and economic problems created by the first Five Year Plan were the subject of Mao Zedong's speech "On the Ten Major Relationships" delivered in April 1956.¹⁷⁵ In that speech, Mao indicated that while he wanted to make China a major industrial power, he was also concerned about preventing the increasing social and economic inequality between the cities and the countryside. Instead of continuing with the Soviet method of industrialization, Mao pushed for a major shift in economic policy in the spring of 1958.¹⁷⁶ A "Great Leap Forward" was instituted which focused on labor mobilization, the collectivization of agriculture and the overall decentralization of industry.¹⁷⁷ One example of this program was the establishment of thousands of "backyard furnaces" to make steel.¹⁷⁸ While this program was consistent with Mao's ideological principles, the lack of any attempt to control the discharges from the furnaces resulted in serious air pollution. One American who lived in China at the time wrote that "[s]ome streets were so thick with smoke [that] it was difficult to see. We could have been in Gary or Pittsburgh."¹⁷⁹

The strains created by the Great Leap Forward coupled with the withdrawal of Soviet technical assistance in 1960¹⁸⁰ and a series of crop failures produced by three years of bad weather¹⁸¹ brought about another shift in economic policy during the early 1960's.¹⁸² Although the move away from the policies of the Great Leap Forward resulted in economic recovery by the mid-1960's, the economic policies of the government were again attacked by Mao, who had been eased out of the day-to-day management of the government after the Great Leap Forward.¹⁸³ Thus, in 1966 Mao launched the Cultural Revolution.¹⁸⁴ Like the Great Leap Forward, which was designed to remedy the economic and social problems of the first Five Year Plan, the Cultural Revolution was a struggle over the ideological problems Mao saw developing out of the economic policies of the early 1960's.¹⁸⁵

During the Cultural Revolution, admissions began to appear in China that the

175. *Reprinted in V SELECTED WORKS OF MAO TSE-TUNG* 284 (1977).

176. See BRUGGER, *supra* note 164, at 179-84.

177. See FAIRBANK, *supra* note 50, at 408-16; BURCHETT & ALLEY, *supra* note 115, at 15-32.

178. See CHEN & GALENSON, *supra* note 165, at 58.

179. SHAPIRO, *supra* note 134, at 173.

180. For a discussion of events leading to the Sino-Soviet split, see BRUGGER, *supra* note 164, at 207-26.

181. See *id.*

182. For a discussion of China's economic policies during the early 1960's, see E. WHEELWRIGHT & B. MCFARLANE, *THE CHINESE ROAD TO SOCIALISM* 68-79 (1970).

183. *Id.* at 94-96.

184. Much has been written about the Cultural Revolution which is now subject to reassessment by the Chinese. For varying accounts by Westerners, see K. KAROL, *THE SECOND CHINESE REVOLUTION* (1973); FAIRBANK, *supra* note 50, at 436-49; and CHESNEAUX, *supra* note 168, at 138-200. The latest Chinese view of the Cultural Revolution is contained in *Resolution on Certain Questions*, *supra* note 67, at 20-26.

185. See Dorrill, *Power, Policy and Ideology in the Making of the Chinese Cultural Revolution*, in *THE CULTURAL REVOLUTION IN CHINA* 21 (T. Robinson ed. 1971).

country had a long standing pollution problem and that the previous methods of economic development were not compatible with environmental protection.¹⁸⁶ Those statements put the blame for the country's environmental problems on Liu Shaoqi, the head of state who was Mao Zedong's chief rival for power.¹⁸⁷ Since Liu was associated with industrialization and the policies of the first Five Year Plan and the early 1960's, domestic pollution was used as another issue in Mao's attacks on those policies. At the same time, the efforts and effects of cleaning up the pollution were attributed to the strength of "Mao Zedong Thought."¹⁸⁸

More important than the expressed concern for environmental quality were the programs undertaken to deal with the pollution problem. While those programs produced important environmental benefits, they were political and economic programs first and environmental programs only second. One of the principal methods used by the Chinese during the Cultural Revolution to deal with pollution was the requirement that all industrial wastes be collected and used for other purposes when possible.¹⁸⁹ While this multi-purpose use program was similar to that undertaken for economic reasons in the 1950's and 1960's during the Cultural Revolution, it also had political purposes.

The multi-purpose use program was part of Mao Zedong's attack on Liu Shaoqi's policies of industrialization. It was based upon the argument that three industrial wastes had caused harm to the environment: waste liquid, waste gas and waste residue.¹⁹⁰ Waste liquid caused large fish kills, corroded ships and destroyed water quality.¹⁹¹ Waste gas invaded farm areas and reduced crop yields or killed crops altogether.¹⁹² Waste residue took up valuable areas of land and, when dumped into rivers, caused them to silt up and hamper navigation.¹⁹³ However, by turning the "harmful into the beneficial," that is, by recovering those harmful wastes and reusing them, the economy and the environment were said to have benefited.¹⁹⁴

A number of successful examples of the reduction of air and water pollution

186. See Orleans & Suttmeier, *The Mao Ethic and Environmental Quality*, 170 SCIENCE 1173 (1970).

187. *Id.* See also *A Chemical Plant Fights Pollution*, CHINA RECONSTRUCTS, May 1977, at 40.

188. One example of this is the Chinese report of efforts to clean-up the pollution discharged by the General Chemical Plant of the Anshan Iron and Steel Company. The plant was said to have produced waste water with high quantities of phenols that damaged local crops, aquatic life and endangered the health of the local people. See Chi, *Turning the Harmful into the Beneficial*, PEKING REV., Jan. 28, 1972, at 5-7. However, during the Cultural Revolution, it was reported that "[a]fter reaching unity in their thinking (i.e., employing Chairman Mao's thinking over Liu Shao-Chi's 'capitalist line') and pooling their collective wisdom and strength, they (the workers) quickly made a device for removing phenol from waste water, 'thus turning the harmful into the beneficial.'" *Id.*

189. See *Putting Waste to Use*, CHINA RECONSTRUCTS, May 1971, at 37; *Industrial Waste Water Serves Agriculture*, CHINA RECONSTRUCTS, Mar. 1972, at 34.

190. See Fang, *Economic Development and Environmental Protection*, PEKING REV., JULY 20, 1973, at 6, 7.

191. See Zhou, *Are All These Wastes?*, BEIJING REV., FEB. 23, 1979, at 24.

192. *Id.*

193. *Id.*

194. *Id.*

based upon the application of the mass participation¹⁹⁵ and self-reliance¹⁹⁶ principles of Mao Zedong Thought were publicized during the Cultural Revolution. However, in evaluating the Chinese claims of reducing industrial pollution during the Cultural Revolution, it is important to keep two points in mind. First, many western observers, who visited China during the early 1970's felt that the environmental projects they saw were typical of the country's nationwide pollution control efforts.¹⁹⁷ In reality they were model pollution control projects publicized to convey an image, both within China and to the outside world, of a country actively pursuing environmental protection.¹⁹⁸ Second, despite Chinese reports of success in improving environmental quality, it is impossible to verify the accuracy of these claims.¹⁹⁹ Revelations since the death of Mao Zedong concerning the deliberate falsification of statistics from the Dachai commune²⁰⁰

195. The city of Tsitsihar in northeastern China was reported to have discharged 250,000 tons of sewage and chemical wastes daily into the Nunchaing River. See Lung, *Tsitsihar Saves Its Fish*, CHINA RECONSTRUCTS, June 1972, at 8. Due to the resulting poor water quality, the fish population in the river was said to have declined dramatically during the 1960's, thereby depriving the city and the province of an important source of food. During the 1970's, a solution was finally reached which partially required local industry to recover its own wastes. However, the main thrust of the pollution control program required the city's workers, peasants, military, students and neighborhood residents to join in the construction of a large sewage diversion project. It was claimed that over a six month period, 5000 people combined to build a six kilometer long dam and a reservoir with a capacity of 20 million cubic meters. The oxygen content of the river was said to have increased, resulting in improved fish yields while the nearby fields were said to have benefited from the use of the diverted sewage as fertilizer. *Id.* A second reported example of water pollution control effect based on mass participation campaigns occurred in Shanghai. During the 1970's a decision was made to attempt to bring the rivers back to their natural state by removing the sediment on the river's bottom which had become contaminated with industrial and domestic wastes. To accomplish this task, a reported 90,000 persons combined to dig out 400,000 tons of sediment from one river in one week alone. Because this sediment was recognized as having value, workers took it to nearby fields and used it as fertilizer. To prevent further pollution of the river, a 30 kilometer pipe was built to carry approximately 300,000 tons of waste water daily from the city to outlying agricultural fields for irrigation purposes. See Schnell, *China's Ways with Waste*, 3 ECOLOGIST 56 (1976); *City Waste Water Irrigates Fields*, CHINA RECONSTRUCTS, Nov. 1971, at 41.

196. The Xuanwu Lake area in Nanjing contained a large number of industrial facilities which, up to 1977, had dumped more than 2000 tons daily of chemical wastes into the lake. See *The Water is Clear Again*, CHINA RECONSTRUCTS, Mar. 1979, at 70. The waste contained variety of hazardous substances such as cynogene, mecury, chromium and lead. However, in 1977 the local government ordered that the pollution be stopped. In response to the order, one plant that discharged lead and acid into the lake set up an anti-pollution group composed of plant workers to find ways to halt the discharge. After visiting the control facilities of another plant, the workers were said to have set out to build their own recovery equipment despite the fact that they lacked the necessary machinery and expertise to build it. After a year of work, the job was done and the waste was no longer discharged. The pollution control efforts by all of the facilities at Xuanon Lake were said to be so successful that the Lake allegedly now contains no mercury and low amounts of cyanogen and chromium. The lake produced 500 tons of fish only a year after the cleanup began. *Id.*

197. For examples of this view, see Kapp, *supra* note 152, at 565; Myers, *supra* note 108, at 33.

198. Caution in praising the Maoist approach to environmental protection was initially expressed in Orleans & Suttmeier, *supra* note 107, at 1176.

199. This stems, in part, from a lack of understanding about Chinese statistical methods. See MacFarlane, *Understanding and Using Chinese Statistics: The Cement Industry As An Example*, 13 J. INT'L L. & ECON. 619 (1979).

200. See Prybyla, *Key Issues in the Chinese Economy*, 21 ASIAN SURV. 925, 945-46 (1981).

have cast doubt on a wide range of Chinese efforts during the Cultural Revolution.

In February 1978 China again altered its course of economic development. In a speech to the first session of the Fifth National People's Congress, Hua Guofeng, then China's premier, presented the draft of a ten-year plan for the 1976-1985 period.²⁰¹ The plan contained the goals of the "four modernizations" along with specific policies and objectives for accomplishing them. At the heart of the plan were industrial goals which centered around heavy industry, construction and natural resources: power stations, iron steel complexes, oil and gas fields, nonferrous metals and coal complexes.²⁰² Those goals, however, quickly proved to be too ambitious for China's financial and technical abilities. Thus, in June 1979 the government began a three-year program to "readjust, restructure, consolidate and improve" the national economy.²⁰³ The most notable aspects of this new policy were China's willingness to accept foreign investment through joint ventures and a renewed emphasis on agriculture and light industry.²⁰⁴

The environmental consequences of the 1978 and 1979 economic policies were serious. With the emphasis on production, and a lack of necessary pollution control equipment, greater amounts of industrial pollution were produced not only in the large cities and industrial centers²⁰⁵ but also in the more remote parts of the country.²⁰⁶ Since the Chinese either ignored or were unable to deal with industrial pollution, they soon began to pay a high price in terms of its effects on public health. Studies released in 1980 by the Cancer Institute showed that respiratory diseases, circulatory diseases and cancer were the leading causes of death for males in China.²⁰⁷ In addition, lung cancer mortality was reported to be higher in the cities than in the countryside and highest in the large industrial cities.²⁰⁸

201. Kallgren, *supra* note 12, at 12-15; Prybyla, *Changes in the Chinese Economy: An Interpretation*, 19 ASIAN SURV. 409 (1979).

202. Kallgren, *supra* note 12, at 13.

203. See Liu, 1979: *One Step Backward for One Leap Forward*, FAR EASTERN ECON. REV., Oct. 5, 1979, at 78. See also Kallgren, *China in 1979: On Turning Thirty*, 20 ASIAN SURV. 1 (1980); and Chen, *China's Recent Economic Readjustment Policy and Reform: Problems and Prospects*, 5 ASIAN THOUGHT & SOC. 309 (1980). In mid-1982 it was announced that the readjustment has not been completed and would remain the basic policy of the Sixth Five-year Plan (1981-1985). The Chinese stated, however, that the readjustment would no longer concentrate on the cancellation of construction projects but rather on revising out-dated methods of enterprising production, technology and organization in order to achieve greater efficiency. See *Prospects for Economic Readjustment*, BEIJING REV., July 26, 1982, at 3 [hereinafter cited as *Prospects*].

204. See *Prospects*, *supra* note 203, at 3.

205. See *Protecting Environment*, Beijing Domestic Service, Sept. 6, 1980, reprinted in FBIS-CHI-80-177, Sept. 10, 1980, at L 17; *Experts Urge Better Protection*, Beijing Xinhua, Sept. 5, 1980, reprinted in FBIS-CHI-80-182, Sept. 17, 1980, at L 33; and *Shanghai Pays Immense Price To Be a Marvel*, N.Y. Times, Apr. 15, 1981, at 7, col. 1.

206. *Nei Monggol Reports Serious Pollution Problem*, Hohhot Nei Monggol Regional Service, Nov. 8, 1980, reprinted in FBIS-CHI-80-219, Nov. 10, 1980, at R 2.

207. *Nation-Wide Cancer Mortality Survey*, 93 CHINA MED. J. 450 (1980).

208. *Id.*

The resulting deterioration of the Chinese environment was demonstrated when members of the United States Environmental Protection Agency visited China.²⁰⁹ The party toured a number of cities and took quantitative measurements of particulate pollution. The party found considerably higher levels of particulates than those recorded in U.S. cities.²¹⁰ Factories in Wuhan and Suzhou operated without pollution control and emitted large amounts of dense, polluted air.²¹¹ The party saw gas masks in one large city.²¹² Most of the pollution was found to have resulted from three sources: heavy industry such as steel mills and petrochemical plants; small manufacturing companies that ran without controls; and coal fires used in homes for heating and cooking.²¹³ On a separate visit by a United States scientific team, serious amounts of pollution also were seen in a number of areas of the country.²¹⁴ In one city, Zhangzhou, the group compared the pollution to that seen in coal towns in Pennsylvania in the 1930's.²¹⁵ Beijing was also reported often to be covered in a gray-brown haze.²¹⁶

The increased pollution resulted in increased complaints from citizens.²¹⁷ An environmental protection office in Beijing reported that in 1978 it received and verified two hundred complaints concerning pollution.²¹⁸ Newspapers and other

209. See Blum, *China's Pollution Problem*, NEW CHINA, Winter 1979, at 27.

210. *Id.*

211. *Id.*

212. *Id.*

213. *Id.* at 27-28.

214. Culliton, *China Adopts New Law for Environmental Protection*, 206 SCIENCE 429 (1979).

215. *Id.*

216. *Id.*

217. Industrial pollution was not the only type of pollution plaguing China at that time. As discussed above, see note 109, *supra*, noise pollution became a serious problem in China with some of the country's cities experiencing higher levels of noise than comparable cities in developed countries. See *Control of Noise Pollution Urged*, *supra* note 109, at 28. Increased vehicular traffic and industrial activities were said to be the source of the noise. See *Beijing Environmental Workshop Discusses Pollution Control*, Beijing Xinhua, Oct. 17, 1979, reprinted in FBIS-CHI-79 203, Oct. 18, 1979, at L 10; and RENMIN RIBAO on *Worsening Pollution in Beijing*, Renmin Ribao, Nov. 9, 1979, reprinted in FBIS-CHI-79-231, Nov. 29, 1979, at R 3 [hereinafter cited as *Worsening Pollution*]. For actual statistics, see Noble, *Noise Pollution in Select Chinese and American Cities*, 46 GEOJOURNAL 573 (1980). Acid rain was another form of pollution which was recognized in China. See *Worsening Pollution*, *supra*, at R 4. This is not surprising since 70% of China's energy needs are supplied by coal which produces a sulfur component of low pH rain. See *What About Energy in China?*, CHINA RECONSTRUCTS, Apr. 1979, at 8. Because of the acid rain problem, the marble surface of the Beijing Palace Museum was said to have begun to erode. See *Worsening Pollution*, *supra*, at R 4. The acid rain problem was part of a larger air pollution problem in China which was never adequately handled and possibly even worsened by traditional pollution control methods. Traditionally large scale factories that could not control their air pollution emissions were moved to specially designated areas away from the city's residential areas. See Yang and Dong, *Wind Regime in Urban Planning and Industrial Production*, 23 SCIENTIA SINICA 766 (1980). Similar zones for water pollution were also located downstream from urban areas. For a discussion of both pollution zones, see Qu, *supra* note 145, at 30.

218. *Peking Residents Appeal for Pollution Control*, PEKING REV., June 9, 1978, at 30 [hereinafter cited as *Appeal for Pollution Control*].

governmental departments stated that they also received a growing volume of complaints.²¹⁹

The government responded to this growing problem by initially "censuring" a variety of heavy and light industrial facilities in June 1978.²²⁰ Stricter action was taken in November 1978 when 167 heavily polluting facilities were ordered to control their pollution by 1982 at the latest.²²¹ The facilities involved included some of China's largest, such as the Paotow Iron and Steel Company, the Shoutu Iron and Steel Company in Beijing, the Shanghai Oil Refinery and the Taching General Petrochemical Works. The decision, made by the State Planning Commission, the State Economic Commission and the State's Environmental Protection Group, threatened a shutdown of the industries unless they complied.²²² The State promised action against those facilities' leaders if no control program was instituted.²²³ In addition, the State ordered that no new facilities could be built without the installation of adequate pollution control equipment.²²⁴

The frequent shifts in economic policy between 1949 and 1979 took a heavy toll on China's environment as well as its plan for economic development. While the supporters both of Mao Zedong and Liu Shaoqi claimed that their methods represented the best means to improve the lives of the people, the environmental consequences of heavy industry and backyard furnaces were not considered by either group. This lack of environmental planning was due to two factors inherent in all of China's pre-1979 economic policies.

First, a factory manager's performance was judged either by the amount he was able to increase productivity or by his political consciousness.²²⁵ Since pollution control equipment would have meant the nonproductive divergence of labor, capital and material, no manager would have undertaken to install such devices unless mandated by party policy. Since neither approach to economic development contained any industrial pollution control policy, no pollution control equipment was installed.

Second, pollution control in the West is usually considered by an industry as a "social cost" which is added to industries' "private costs" to arrive at a final product cost.²²⁶ However, since China during that time did not have a pollution control policy and since private landowner's suits were not possible, special costs were without a value. As a result, product costs reflected only the industry's

219. *Control of Noise Pollution Urged*, *supra* note 109, at 28.

220. *See Appeal for Pollution Control*, *supra* note 218, at 30.

221. *Order for Control of Environmental Pollution*, PEKING REV., Nov. 24, 1978, at 31.

222. *Id.*

223. *Id.*

224. *Id.*

225. The problems that industry has in economically rationalizing pollution control equipment in a nonmarket economy are discussed in Goldman, *The Convergence of Environmental Disruption*, 170 SCIENCE 37 (1970).

226. *See ENVIRONMENTAL PROTECTION* 60-63 (L. Jaffe & L. Tribe eds. 1971).

private costs plus a set profit. Since industry never took in money for social costs, there was no incentive to consider the cost of pollution.

The result of these policies is that the Chinese now are forced not only to deal with the physical effects of years of industrial pollution, but they must also overcome the reluctance of officials and factor managers to take the consequences of pollution seriously.²²⁷

IV. ENVIRONMENTAL PROTECTION THROUGH LEGISLATION

China's approach to environmental protection through the use of written laws has its origins in a number of actions taken during the 1970's.²²⁸ In 1973 the State Council called a National Conference on Environmental Protection to review a survey detailing the extent of pollution in the country.²²⁹ As a result of work done at that conference, the State Council produced a document entitled "Several Regulations on Environmental Protection and Improvement."²³⁰ The following year, the State Council established the Environmental Protection Leading Group (EPLG) to act as a coordinating and planning body for environmental matters.²³¹ In 1978 the Central Committee of the Chinese Communist Party approved an EPLG document entitled "The Key Notes of the Summary Report on the Work of Environmental Protection."²³² Finally, in 1978 China adopted a new constitution which provides in Article 11 that "the state protects the environment and natural resources and prevents and eliminates pollution and other hazards to the public."²³³

The significance of these actions, apart from their influence on China's subsequent environmental laws, is that they show that by the early 1970's top Chinese officials were seriously concerned about environmental problems and were seeking ways to deal with them. However, it is important to note that the documents produced by the State Council and the EPLG were not widely circulated or made public until after the death of Mao Zedong in 1976. Thus, while officials slowly realized that the previous policies and programs were no longer adequate, the

227. Popular accounts in newspapers were used to aid in the attempt to overcome the reluctance some persons had in dealing with the economic effects of pollution. One newspaper editorial discussing the need for wildlife protection stated that "[o]ne owl . . . can destroy nearly 1,000 rats a year, thus 'saving 1 ton of grain.'" *The China that Outsiders Rarely See*, U.S. NEWS & WORLD REP., Oct. 22, 1979, at 85, 86.

228. For a discussion of the origins of China's environmental legislation, see *Li Chaobo Explains Environmental Protection Law at NPC Session*, Beijing Xinhua, Sept. 11, 1979, reprinted in FBIS-CHI-79-179, Sept. 13, 1979, at L 1 [hereinafter cited as *Li Chaobo Explains*].

229. The significance of the national conference is discussed in Boxer, *Protecting the Environment*, ENVIRONMENT, June 1981, at 15-16.

230. See *Li Chaobo Explains*, *supra* note 228, at L 1.

231. *Id.*

232. *Id.*

233. CONSTITUTION OF THE PEOPLE'S REPUBLIC OF CHINA, art. 11 (1978), as translated in CONSTITUTIONS, *supra* note 13.

political situation prevented the quick adoption of new methods to deal with pollution.²³⁴ Only after it was decided to move towards a formal legal system was it possible to set out the state's environmental policies in the form of written laws.

In 1979 the policies formulated by the EPLG and the constitutional mandate were implemented by the announcement of two laws designed to protect the environment: the Forestry Act²³⁵ and the Law on Environmental Protection.²³⁶ While the Forestry Act, adopted in February 1979, deals only with one aspect of the environment, the Law on Environmental Protection, adopted in September 1979, is a comprehensive national law aimed at environmental protection. Before discussing the influence of past attitudes, policies and programs on this legislation, it is necessary to analyze briefly the content of the laws.

A. *The Forestry Act*

The Forestry Act provides for the management, expansion and protection of China's forest resources principally for economic reasons. However, the Act is also significant for its recognition of the environmental importance of forests.²³⁷

Article 1 of the Act designates forests as "important resources of the country" which, in addition to providing "the timber and various forestry products needed for the economic construction of the state and the livelihood of the people," also "prevent and control air pollution, protect and beautify the environment, and promote the people's health in body and mind."²³⁸ Forest resources are broadly defined under the Act to include "trees, bamboo and wooded lands as well as all plants and animals within the boundaries of forestry areas."²³⁹ All forests are then classified according to their intended use, the most relevant of which are "firewood and charcoal forests" and "forests with special uses."²⁴⁰

The Forestry Act defines "firewood and charcoal forests" as "[t]all trees and shrubs that are used mainly for the purpose of producing fuels."²⁴¹ All commune production brigades and teams are required to plant such forests to meet their needs for fuel.²⁴² Production from the forests is controlled by the government according to set plans and no unauthorized unit or individual is permitted

234. The truth about the country's environmental condition was released slowly and showed that the years of enthusiastic reports published both by outsiders were either naive misconceptions or widescale misrepresentations. See e.g., Smil, *Environmental Degradation in China*, 20 ASIAN SURV. 777, 778-79 (1980) [hereinafter cited as Smil, *Degradation*].

235. Forestry Act, *supra* note 8.

236. Law on Environmental Protection, *supra* note 9.

237. The problem of deforestation and recent attempts at afforestation are discussed in Westoby, *Making Green the Motherland: Forestry in China*, in CHINA'S ROAD TO DEVELOPMENT, *supra* note 116, at 321.

238. Forestry Act, *supra* note 8, art. 1.

239. *Id.* art. 2.

240. *Id.* arts. 2(4) and 2(5).

241. *Id.* art. 2(4).

242. *Id.* art. 23(3).

to enter the forest area to cut trees or to buy timber.²⁴³ The designation of forests specifically for energy needs is significant for China since demand for fuel wood has traditionally outstripped supply, resulting in severe deforestation problems.²⁴⁴

"Forests with special uses" are "[f]orests and trees that are used mainly for environmental protection, scientific experiments and other special purposes."²⁴⁵ The Act specifically prohibits cutting firewood, grazing livestock or quarrying in such forest areas.²⁴⁶ "Cities and industrial and mining zones" are required by the Act to build "garden forests and environmental protection forests" in order to provide each person with a "tree-covered area" of not less than five square meters.²⁴⁷ In addition, the state and local governments must designate the habitats of rare animals and plants as "natural preservation areas" and set up organizations to manage them and carry out scientific research.²⁴⁸

The Act places the responsibility for the care of forest areas on everyone. Article 7 states that "[i]t is the glorious obligation and right of the people of the whole country to plant trees, carry out afforestation and take care of and protect forests."²⁴⁹ Local governments are required to "constantly carry out propaganda and education in the need to love and protect forests and arouse the masses to protect forests and trees."²⁵⁰ They are also instructed by the Act to organize the people to plant trees and carry out afforestation on tree-planting days each year or at other appropriate times.²⁵¹

More specifically, the Act provides that the Ministry of Forests is responsible for the country's forestry operations while forestry management organizations established under local governments are to handle local forestry development.²⁵² To ensure the full implementation of forestry policies and decrees, the state procuratorial organs are to assign forestry inspectors to county forestry departments and state forests.²⁵³ The Act provides that forest protection personnel are to be appointed at the local level and given the job of patrolling the forests, preventing all acts of damage to forests, and delivering those who set forest fires or damage forests to local public security departments "for handling."²⁵⁴

The long-range goal of the Forestry Act is to have thirty percent of China

243. *Id.* art. 31.

244. See Revelle, *Energy Dilemmas in Asia: The Needs for Research and Development*, 209 SCIENCE 160 (1980).

245. Forestry Act, *supra* note 8, art. 2(5).

246. *Id.* art. 19.

247. *Id.* art. 23(4).

248. *Id.* art. 20.

249. *Id.* art. 7.

250. *Id.*

251. *Id.*

252. *Id.* art. 8.

253. *Id.* art. 9.

254. *Id.* art. 17.

forest covered.²⁵⁵ To accomplish this objective, the Act requires that counties in mountainous areas have over forty percent forest cover, while hilly areas should be twenty percent forest cover and plains ten percent forest cover.²⁵⁶

The money to meet the afforestation targets is to come from a tax system established under the Act. A fixed "forest culture fee" is to be levied on the sale of timber, bamboo and other forestry products.²⁵⁷ The fee is then paid into a "forest culture fund" which is to be used for the purpose of preparing deforested land for new forest growth and for the building of new forests.²⁵⁸ The Act also gives the country's coal industries and paper manufacturing industries permission to set aside their own moneys in order to plant forests which will provide "timber for mine shaft props and the raw material for manufacturing paper."²⁵⁹

In order to protect the country's forests, the Act contains a number of specific prohibitions. For example, the destruction of forests for land reclamation or "sideline production" is prohibited and if any individual or group commits such destruction, they are required to restore it "within a set period of time."²⁶⁰ In addition, any felling of trees in violation of the regulations set out in the Act are prohibited. One such regulation is that "[i]n protective forests such as forests for environmental protection and for landscape improvement and seed tree forests, no cutting other than for regeneration purposes is permitted."²⁶¹ Similarly, the Act provides that "[n]o cutting of any nature should be permitted in forests intended for ecological protection."²⁶²

In order to encourage compliance with the Act and its objectives, the Forestry Act establishes a system of rewards. State and local governments are required to provide "moral encouragement or material rewards" to "meritorious units" in proportion to the significance of the contributions that they have made.²⁶³ To determine which units may receive an award, eight categories are set out, one of which rewards those units that have made "outstanding achievements in forest protection and have been free of forest fires for 3 consecutive years."²⁶⁴ "Meritorious individuals" may also receive awards.²⁶⁵ One of the six stipulated categories requires that an award be given to "[a]n individual who has played an exemplary role in enforcing law and implementing forestry policy and scored remarkable achievements in resolutely struggling against infractions of law."²⁶⁶

255. *Id.* art. 23(1).

256. *Id.*

257. *Id.* art. 16.

258. *Id.*

259. *Id.*

260. *Id.* art. 19.

261. *Id.* art. 30(2).

262. *Id.* art. 30(3).

263. *Id.* art. 35.

264. *Id.* art. 35(2).

265. *Id.* art. 36.

266. *Id.* art. 36(4).

For those who do not comply with its requirements, the Act provides for a variety of punishments. Article 37 requires that disciplinary actions "of varying degrees," including dismissal from public office, be taken against state workers who are found to have "defied policies, laws, rules and regulations in forestry and caused damage to forests or serious waste of lumber."²⁶⁷ For those who have destroyed trees "in rural and urban areas, around houses and villages and along roads and waterways" the law requires that they be "asked to grow three trees for each one they have destroyed or pay a fine."²⁶⁸ For "not so serious" violations, the Act requires that violators "make compensation for the losses or pay a fine and turn in any illegally obtained property."²⁶⁹ For "serious violations," such as "[c]ollecting firewood, grazing flocks and gathering pebbles and stones in . . . a forest built for any other special purpose," or "[v]iolating regulations governing natural preservation or hunting control," the Act requires that the person be "punished by law."²⁷⁰

B. *The Law on Environmental Protection*

Despite the need to stem the growing pollution problem in China, the Law on Environmental Protection does not establish stringent pollution standards. Rather, as Li Chaobo, the director of the EPLG, pointed out, the law's purpose is only to outline China's basic policies on environmental matters.²⁷¹ In that way, the law is similar to the United States' National Environmental Policy Act,²⁷² in which Congress only attempted to state the overall degree of protection that should be given to the environment.

A number of sources were drawn upon in the drafting of the Law on Environmental Protection. The EPLG has stated that it looked to the success of foreign governments in controlling pollution through legal measures and made "full use" of foreign lessons and experiences in environmental protection.²⁷³ As is common in drafting all legislation in China, the EPLG also solicited opinions from the State Council, industries, schools, communes and other interested groups.²⁷⁴

The general principles of the Law on Environmental Protection are set out in Chapter One. According to Article 2, the law's objective is to "rationally utilize

267. *Id.* art. 37(2).

268. *Id.* art. 38.

269. *Id.* art. 39.

270. *Id.* art. 39(3) & (4).

271. See *Li Chaobo Explains*, *supra* note 228, at L 1.

272. 42 U.S.C. § 4321 (1969). The policy goals which the Act was meant to express may be found in Senate Committee on Interior and Insular Affairs, National Environmental Policy Act of 1969, S. REP. NO. 91-296, 91st Cong., 1st Sess. 5-6 (1969), reprinted in U.S. ENVIRONMENTAL PROTECTION AGENCY, LEGAL COMPILATION, January 1973, at 420, 425-28.

273. See *Li Chaobo Explains*, *supra* note 228, at L 1.

274. *Id.*

the natural environment and control and prevent pollution and damage to the ecology so as to create a clean and salubrious environment for the people's life and work, protect people's health and promote economic growth in the interest of social modernization."²⁷⁵ The law uses the term "environment" to include "air, water, land, mineral resources, forest, grasslands, wild plants and animals, aquatic life, places of historical interest, scenic spots, . . . resorts and natural areas under special protection as well as inhabited areas of the country."²⁷⁶

New to the environmental protection effort in China are three sections in the law which specifically state the future obligations of *potential* polluters. First, Article 5 requires the State Council, its departments and local governments to participate in the protection of the environment.²⁷⁷ It states that in the formulation of national economic plans, "overall arrangements" must be made to protect and improve the environment.²⁷⁸ An obligation is also placed on governmental units to work out plans to control and eliminate existing pollution.²⁷⁹

Second, Article 6 directs that all "enterprises and other undertakings" must pay "adequate attention" to environmental pollution in "selecting construction sites, making designs, carrying out construction projects and embarking on production."²⁸⁰ Before design work is permitted to begin on new facilities or the renovation of existing facilities, a "report on matters" must be submitted to and approved by the government.²⁸¹ This report must anticipate the environmental impact the project may have.²⁸² Approval will be given only if pollution control devices are built along with the project and are put into operation simultaneously with the project.²⁸³ Any discharge emitted by the project must be within the standards prescribed by the state.²⁸⁴ Factories which are already causing pollution must take effective steps to bring the pollution under control or else stop production, change their manner of operation or seek relocation.²⁸⁵

Finally, the law requires that urban areas must be designed to prevent pollution. Article 7 states that in renovating older urban areas and in building new towns, "an appraisal" of the possible impact on the environment must be made.²⁸⁶ The Article stipulates that no enterprise or factory which might pollute the environment can be built near residential areas in cities and towns or beside protected water areas, places of historical interest, scenic spots, hot springs,

275. Law on Environmental Protection, *supra* note 9, art. 2.

276. *Id.* art. 3.

277. *Id.* art. 5.

278. *Id.*

279. *Id.*

280. *Id.* art. 6.

281. *Id.*

282. *Id.*

283. *Id.*

284. *Id.*

285. *Id.*

286. *Id.* art. 7.

resorts or natural areas under protection.²⁸⁷ Existing facilities which cause pollution must take steps to control their pollution or move to other localities within a specified period.²⁸⁸

The Second Chapter of the Law on Environmental Protection deals with the protection of the natural environment. This Chapter calls for the protection and rational utilization of land,²⁸⁹ water,²⁹⁰ minerals,²⁹¹ forests²⁹² and forage (grasslands)²⁹³ resources. Wasteland can only be reclaimed after comprehensive scientific research is carried out to prevent ecosystem damage.²⁹⁴ This Chapter also prohibits indiscriminate mining practices and requires that mining waste be properly disposed of to prevent environmental damage.²⁹⁵ Valuable and rare animals and plants are also accorded protection under this Chapter, and the catching, picking, or hunting of these life forms is prohibited.²⁹⁶

Since industrial pollution is the principal source of many of the environmental problems in China, the Law on Environmental Protection requires the adoption of a series of measures to control and prevent pollution, including the development of new technology and methods of processing as well as new products which will be totally or practically pollution-free.²⁹⁷ Article 18 requires the multi-purpose use of waste gas, waste water and slag in order "to turn harm into benefit."²⁹⁸ Industries that discharge these waters in excess of state standards are given a period of time in which to comply.²⁹⁹ After that time, the facility may be required to limit its production and fines may be levied according to the amount and density of pollutants.³⁰⁰

Control of pollution in the workplace is also required under Chapter Three. Article 22 states that excess noise must be controlled and that machines, motor-driven vehicles, and planes that cause "enormous" noise and vibrations must have silencers installed.³⁰¹ Article 24 requires the registration and control of poisonous and radioactive materials.³⁰² Under Article 23, airtight production equipment and processing methods are required in those units where harmful

287. *Id.* art. 6.

288. *Id.*

289. *Id.* art. 10.

290. *Id.* art. 11.

291. *Id.* art. 12.

292. *Id.* art. 13.

293. *Id.* art. 14.

294. *Id.* art. 10. The requirement that scientific research must be conducted before a reclamation project has begun is similar to the "report on matters" requirement in Article 6.

295. *Id.* art. 12.

296. *Id.* art. 15.

297. *Id.* art. 18.

298. *Id.*

299. *Id.*

300. *Id.*

301. *Id.* art. 22.

302. *Id.* art. 24.

gas and dust may spread.³⁰³ Ventilation, dust collection, air purification and reclamation systems must be installed to prevent worker exposure.³⁰⁴ Any harmful gas or dust that does exist in the workplace must meet standards set by the state.³⁰⁵

Chapter Four describes the administrative organization which will be set up under the law. An environmental protection organization will be established and will have a variety of research, compliance and supervisory responsibilities.³⁰⁶ A network of local bureaus will also be set up and will include a group directly under central government control and another group outside of the central government.³⁰⁷ The local organizations are given a number of responsibilities which include overseeing compliance and drafting standards.³⁰⁸ Under this Chapter, institutions and enterprises are also required to set up their own environmental protection organizations.³⁰⁹

Chapter Five deals with environmental research, "propaganda" and education. Article 29 states that the Chinese Institute of Environmental Sciences, concerned scientific research organizations and institutions of higher learning are required to undertake research in a variety of areas of environmental science.³¹⁰ The significance of this Article is that it indicates that future solutions of environmental problems may go beyond traditional pollution control methods. However, this Chapter also requires that propaganda and educational programs be instituted so that the "broad masses" will have a better understanding of environmental problems.³¹¹

Chapter Six outlines the Law on Environmental Protection's system of rewards and punishments. Under this Chapter, the government may issue a commendation to any individual or unit which makes "noticeable achievement and contributions" to environmental protection.³¹² The remaining system of rewards is applicable only to a limited group of facilities which reuse waste gas, waste water or residue as their main raw materials.³¹³ Only those facilities may have their taxes reduced or eliminated completely if they comply with the law.³¹⁴ In addi-

303. *Id.* art. 23.

304. *Id.*

305. *Id.*

306. *Id.* art. 26.

307. *Id.* art. 27.

308. Permitting local governments to set their own standards could be a serious problem since the degree of environmental protection may vary with the locality. However, under Article 26(F) the environmental protection organization set up by the State Council is allowed to "direct" the work of local organizations and may thereby be able to establish a minimum standard which local organizations must follow. *Id.* art. 26(F).

309. *Id.* art. 28.

310. *Id.* art. 29.

311. *Id.* art. 30.

312. *Id.* art. 31.

313. *Id.*

314. *Id.*

tion, profits from those facilities will not be required to be turned over to the state.³¹⁵ Instead, the facilities are ordered to use the profits to buy pollution control equipment.³¹⁶

Punishment under Chapter Six is not as limited in scope as the rewards system.³¹⁷ Under this Chapter, environmental protection organizations at different levels are given the power to "criticize" units that pollute or present a public hazard, issue warnings and even levy fines.³¹⁸ These environmental protection organizations may also order the polluting unit to compensate others for any losses they have incurred or order the polluting unit's production to be completely stopped.³¹⁹ Those responsible for the pollution may be investigated for their administrative, economic or even criminal responsibility.³²⁰

The standing necessary to force compliance with the Law on Environmental Protection is extended to all citizens under the law. Under Article 8, individuals have "the right to supervise, inform against and accuse any departments or individuals of causing environmental pollution and damage."³²¹ Government departments and individuals are prohibited from using retaliatory measures against those who do complain.³²² Thus, citizens may take an active role in protecting the environment through legally defined methods without the need of a special property interest that has proved especially troublesome under U.S. environmental laws.³²³ The punitive sections indicate that China will rely not only on traditional peer pressure methods, *i.e.*, criticism, to control pollution, but also on economic and legal methods.

C. *Environmental Legislation: Continuity or Contrast?*

It is still too early to judge the success or failure of the Forestry Act and the Law on Environmental Protection in protecting and improving China's physical environment. The next section of this article will attempt to draw some preliminary conclusions based upon events during the past three years. An important factor in drawing these conclusions is the relationship of the attitudes and policies of the past to the goals and methods of the laws.

1. Environmental Legislation and the Attitude Toward Nature

Earlier in this article³²⁴ it was pointed out that China's philosophy of nature

315. *Id.*

316. *Id.*

317. *See id.* art. 32.

318. *Id.*

319. *Id.*

320. *Id.*

321. *Id.* art. 8.

322. *Id.*

323. *See* W. RODGERS, JR., HANDBOOK ON ENVIRONMENTAL LAW 23-30 (1977).

324. *See* text accompanying notes 20-37 *supra*.

and economic necessity have been strong influences on the environment. Although the Forestry Act and the Law on Environmental Protection attempt to create a balance between environmental quality and industrial needs, the laws give priority to environmental concerns in the event of conflict.

The attempt to balance the needs of the environment and the economy is best demonstrated by Article 2 of the Law on Environmental Protection. Article 2 does not separate the environment from the economy but states that environmental protection is an essential ingredient in economic growth.³²⁵ This recognition of the necessity of both interests is further illustrated by the creation, in the Forestry Act, of specially designated forest areas, some for energy and timber needs and some for conservation.³²⁶ While deforestation has been a serious problem in China,³²⁷ the Act does not attempt the unrealistic but instead sets aside certain areas for cutting³²⁸ while completely banning it in others.³²⁹

Despite the goal of balancing the needs of both the environment and the economy, other sections of the Law on Environmental Protection make it clear that where this goal cannot be achieved, the burden will be placed on industry.³³⁰ A number of sections in the Law on Environmental Protection impose potentially large costs on government bodies, enterprises and urban areas in order to prevent pollution.³³¹ New designs must be made, pollution control equipment must be devised, manufactured and installed, environmental impact studies must be made, alternative methods of waste disposal must be found and even entire factories may have to be moved.³³² All of these goals are desirable and necessary. However the question remains as to how soon China will be able to meet these goals given the current emphasis on, and allocation of limited resources to, economic development projects. Whether the Chinese will permit those projects to be delayed and extra costs imposed upon them in the name of environmental protection will be an important test of the attitude toward the new laws.

2. Environmental Legislation and the Attitude Toward Law

Although the use of written law to declare public policy does not follow the traditional Chinese emphasis on unwritten norms,³³³ the Forestry Act and the Law on Environmental Protection nevertheless are consistent with Chinese attitudes toward legislation. First, the Chinese have always recognized that, for

325. Law on Environmental Protection, *supra* note 9, art. 2.

326. Forestry Act, *supra* note 8, art. 2.

327. See Morgan, *Smokestacks and Pagodas: One Man's Impressions of China*, SIERRA, Oct. 1977, at 27.

328. See Forestry Act, *supra* note 8, art. 31.

329. *Id.* art. 2(5).

330. See, e.g., Law on Environmental Protection, *supra* note 9, arts. 6, 18 and 22-24.

331. *Id.* arts. 5-7 and 10-25.

332. See *id.* art. 6.

333. See text accompanying notes 38-65 *supra*.

certain purposes, written rules are required.³³⁴ Thus, the new environmental laws are designed for specific purposes and are not comprehensive codes. Second, the two laws were adopted only after other means had been proved unsuccessful.³³⁵ Finally, the laws deal with a matter of public, rather than private, interest. The "contradictions" that have arisen concerning the environment are not the kind that can be settled by the traditional methods of conciliation or mediation.

A novel feature of the Law on Environmental Protection, however, is the provision in Article 8 giving citizens the right "to supervise, inform against and accuse any department or individual of causing pollution and damage."³³⁶ This grant of supervisory rights to the individual against the government is a break with past laws which instead entrusted government authorities with their enforcement, and which provides for little or no participation by ordinary citizens.³³⁷ For this reason, it is not likely that Article 8 will have a significant impact on environmental protection.

3. Environmental Legislation and Ideology

Finally, the Forestry Act and Law on Environmental Protection preserve some aspects of Mao Zedong Thought but depart from it in many important areas. The strongest example of the influence of Mao Zedong Thought in the environmental legislation is Article 4 of the Law on Environmental Protection. This Article provides: "Work concerning environmental protection shall be done in accordance with the principles of overall planning, rational arrangement, multipurpose utilization, changing harmful things into beneficial ones, relying on the masses and engaging everybody in protecting the environment and benefiting the people."³³⁸ Despite this statement of overall support for the general principle of Mao Zedong Thought, an examination of the legislation shows little compliance with it.

Two of the strongest aspects of Mao Zedong Thought were populism and an emphasis on rural areas over cities.³³⁹ The general stress on environmental protection in the Forestry Act and the Law on Environmental Protection emphasizes rural areas over industry. In addition, Article 4 of the Law on Environmental Protection and Article 7 of the Forestry Act place a duty on the masses to carry out environmental work. However, further examination of both laws indicates an important shift away from populism. Both laws rely heavily on the creation of an environmental bureaucracy to carry out the goals of the laws. In

334. See text accompanying notes 28 and 63-64 *supra*.

335. *Id.*

336. Law on Environmental Protection, *supra* note 9, art. 8.

337. See text accompanying notes 51-52 and 57-60 *supra*.

338. Law on Environmental Protection, *supra* note 9, art. 4.

339. See text accompanying notes 87-92 *supra*.

the case of the Forestry Act, this includes forestry management organizations and corporations for enterprise management.³⁴⁰ In the case of the Law on Environmental Protection, Chapter 4 provides for the creation of an environmental protection organization.

Mao Zedong placed great emphasis on mass campaigns to carry out and implement his policies.³⁴¹ However, the new environmental legislation places most of the responsibility for its enforcement on the government. Although Article 4 of the Law on Environmental Protection does urge that environmental work be carried out by "engaging everyone in protecting the environment,"³⁴² and Article 7 of the Forestry Act states that "all localities shall organize the masses to plant trees and carry out afforestation,"³⁴³ most of the responsibility is left to government agencies. In part this is because the mass campaigns of the past were aimed at cleaning up particular problems.³⁴⁴ The Law on Environmental Protection, however, aims at preventing pollution, particularly from industry. This is a task which is not suited to mass campaigns.

Mao stressed "politics in command" and emphasized the importance of ideological consideration.³⁴⁵ The new environmental legislation, however, contains provision both for moral encouragement and material rewards.³⁴⁶ More importantly, both laws provide for fines in case of violation of the laws.³⁴⁷

Finally, the Law on Environmental Protection will require an extensive amount of new technology and equipment to prevent and control pollution.³⁴⁸ If the Chinese are serious about meeting these requirements, it will require a substantial amount of research and development or the importation of pollution control systems from the West. This, in turn, will test the Maoist principle of self-reliance.³⁴⁹ At the present time, China simply does not have the type nor the amount of sophisticated pollution control equipment that it needs nor will it have the technology to develop it in the near future. Thus, the country may be forced to turn to the West for help.³⁵⁰

V. ENVIRONMENTAL POLICIES, REGULATIONS AND PROGRAMS SINCE 1979

The three years since the adoption of the Forestry Act and the Law on Environmental Protection have seen a new attitude and approach toward envi-

340. Forestry Act, *supra* note 8, art. 8.

341. See text accompanying notes 93-94 *supra*.

342. Law on Environmental Protection, *supra* note 9, art. 4.

343. *Id.* art. 7.

344. See § II.C.2 *supra*.

345. See text accompanying notes 95-96 *supra*.

346. See text accompanying notes 263-66 and 312-16 *supra*.

347. See text accompanying notes 268-70 and 318-19 *supra*.

348. Many sections of Chapter Three of the Law on Environmental Protection are technology forcing sections. See text accompanying notes 297 and 299-305 *supra*.

349. See text accompanying note 102 *supra*.

350. For a discussion of China's policy on the importation of technology from the West, see *Importing Technology: Plans Readjusted, Policy Unchanged*, BEIJING REV., July 27, 1979, at 9.

ronmental problems in China. While the state of the environment was determined by programs aimed at other goals during the 1950's and 1960's and was merely a political issue during the Cultural Revolution, the numerous conferences and articles on environmental matters since 1979 indicate a genuine concern for the serious threats of pollution and damage to natural resources.

Although the Law on Environmental Protection sets out China's overall policy toward environmental protection, Article 5 of that law leaves it up to the State Council and local governments to devise specific standards and regulations.³⁵¹ In the past three years the Chinese have announced a series of policy directives, local regulations and programs to carry out this legal mandate.

The most important policy statement on environmental matters since the legislation of 1979 is the "Decision on Strengthening the Work of Environmental Protection in the Period of National Economic Readjustment," issued by the State Council in March 1981.³⁵² The Decision of the State Council set out six broad areas of environmental concern. First, the Decision of the State Council restates the goal, contained in Article 6 of the Law on Environmental Protection, of preventing new forms of pollution.³⁵³ In its statement, the State Council directed all government departments to review construction projects and, if they waste natural resources or energy or do not have effective pollution control systems, to halt them.³⁵⁴

Second, the Decision of the State Council focuses on the necessity of finding solutions to existing pollution problems. It places particular emphasis on pollution control in cities and areas where industrial sites are located. Like Article 7 of the Law on Environmental Protection, the Decision of the State Council requires factories which create pollution in residential areas, water source preservation zones and scenic tourist areas either to control their pollution or else merge, change to other lines of production or close down.³⁵⁵

Third, the Decision of the State Council stresses the need to preserve natural resources. It states that the exploitation and use of natural resources must not damage water, soil or forest areas.³⁵⁶ Specifically, the Decision of the State Council requires that environmental impact statements must be made before the

351. Article 5 of the Law on Environmental Protection provides as follows:

The State Council and its subordinate departments as well as local people's governments at all levels must effectively protect the environment. While formulating national economic development plans, overall arrangements for environmental protection and improvement shall be made, and such protection and improvement shall be carried out conscientiously and in an organized manner. Necessary plans must be worked out to cope with any existing environmental pollution and other hazards to the public so as to eliminate them in a planned and gradual way.

Law on Environmental Protection, *supra* note 9, art. 5.

352. *State Council Decision on Environmental Protection*, Beijing Xinhua, Mar. 12, 1981, reprinted in FBIS-CHI-81-049, Mar. 13, 1981, at L 2 [hereinafter cited as *State Council Decision*].

353. *Id.*

354. *Id.*

355. *Id.*

356. *Id.* at L 3.

construction of water conservancy projects is undertaken.³⁵⁷ In addition, lake damming, river filling, excessive tapping of underground water and other activities that damage water resources are forbidden.³⁵⁸

Fourth, the Decision of the State Council states a policy of protecting the environment in Beijing and the historical and scenic cities of Hangzhou, Suzhou and Guilin.³⁵⁹ Fifth, the Decision of the State Council urges more widespread and thorough environmental planning.³⁶⁰ Finally, the Decision of the State Council urges intensified environmental surveys, scientific research and personnel training.³⁶¹ This includes the establishment of pollution monitoring stations, environmental research institutes and special courses at universities.³⁶²

While the Decision of the State Council is a strong reaffirmation of China's commitment to environmental protection, it is, by and large, a restatement of the Law on Environmental Protection and is thus a policy statement rather than a set of comprehensive rules. Instead, specific implementation of the Law on Environmental Protection is contained in a series of local regulations, adopted during the past three years by approximately a dozen provincial³⁶³ and city governments,³⁶⁴ aimed at industrial pollution.

In March 1981 the Beijing municipal government adopted regulations to control industrial air pollution.³⁶⁵ These regulations provide that all projects that might cause air pollution must install pollution control devices during construction.³⁶⁶ Failure to comply can result in fines.³⁶⁷ In addition, factories which discharge soot and smoke exceeding a density of 200 milligrams per cubic meter will be fined from two and one-half to ten percent of their fuel fee.³⁶⁸ The regulations also state that factories that produce or sell boilers or kilns without

357. *Id.*

358. *Id.*

359. *Id.*

360. *Id.*

361. *Id.*

362. *Id.*

363. The following provinces are reported to have adopted environmental regulations: Shanxi, Gansu, Zhejiang, Hebei, Hubei, Guizhou, Liaoning, Shandong, Hunan, Yunnan and Anhui. See *Government, Environmental Agencies Tackle Pollution*, Beijing Xinhua, Aug. 18, 1980, reprinted in FBIS-CHI-80-162, Aug. 19, 1980, at L 11; and *Anhui Environmental Protection*, Hefei Anhui Provincial Service, Jan. 9, 1981, reprinted in FBIS-CHI-81-008, Jan. 13, 1981, at O 8 [hereinafter cited as *Anhui Environmental Protection*].

364. The two principal cities that have adopted environmental regulations are Beijing and Guangzhou. See *Beijing Works to Control Air, Water Pollution*, Beijing Xinhua, Mar. 27, 1981, reprinted in FBIS-CHI-81-060, Mar. 30, 1981, at R 1 [hereinafter cited as *Beijing Works*.]; and *Provincial, Local Governments to Fine Polluting Factories*, Beijing Xinhua, July 19, 1980, reprinted in FBIS-CHI-80-141, July 21, 1980, at L 15.

365. For a discussion of the "Tentative Regulations on Strengthening Management of Boilers and Kilns Emitting Soot and Smoke," see *Beijing to Fine Units Polluting Environment*, Beijing Xinhua, Apr. 22, 1981, reprinted in FBIS-CHI-81-078, Apr. 23, 1981, at R 1 [hereinafter cited as *Beijing to Fine Units*].

366. *Id.*

367. *Id.*

368. *Id.*

pollution control devices will be fined ten percent of the price of the boiler or kiln.³⁶⁹ Finally, factories that cause serious pollution accidents must compensate the victims for their loss.³⁷⁰

In April 1981 the Beijing municipal government enacted a second set of regulations designed to control industrial water pollution.³⁷¹ Under those regulations, all factories that discharge waste water containing poisonous substances will be fined per cubic meter of waste water.³⁷² The amount of the fine will depend upon the type of poison.³⁷³ The regulations also ban all discharges of waste water through seepage pits or wells.³⁷⁴ Factories which violate that provision will be fined double.³⁷⁵

All of the local regulations rely on a combination of incentives and penalties in order to secure compliance. The Anhui Province regulations,³⁷⁶ for example, provide for honorary titles and cash awards to factories and individuals that protect the environment.³⁷⁷ In addition, no tax will be levied for one to three years on products made by using industrial wastes.³⁷⁸ Profits earned by recovering useful material from industrial wastes need not be paid to the state for five years.³⁷⁹ However, a tax or fine will be levied on factories which continue to discharge pollutants or fail to complete or operate their waste disposal projects on time.³⁸⁰

In addition to environmental regulations which are aimed at controlling the various forms of industrial pollution, the Chinese have continued to rely on mass participation campaigns to deal with other environmental problems. In July, 1980, the Standing Committee of the Shanghai Municipal People's Congress called for a "patriotic health campaign" to eliminate pests and disease, to improve environmental sanitation, to control the breeding of mosquitoes and flies and to plant trees.³⁸¹ A similar call was made the next month by the Minister for Health to clean up sewage and rubbish, thereby reducing the chances for infectious and epidemic diseases.³⁸² The largest mass participation campaign undertaken since the death of Mao Zedong was the "National Socialist Ethics and

369. *Id.*

370. *Id.*

371. *Id.*

372. *Id.*

373. *Id.*

374. *Id.*

375. *Id.*

376. *Anhui Environmental Protection*, *supra* note 363 at O 8.

377. *Id.*

378. *Id.*

379. *Id.*

380. *Id.*

381. *Shanghai People's Congress Standing Committee Meets*, Shanghai City Service, June 25, 1980, reprinted in FBIS-CHI-80-128, July 1, 1980, at O 2.

382. *Minister for Health Calls for Summer Health Campaign in China*, 93 CHINA MED. J., Aug. 1980, at 518.

Courtesy Month" of March 1982.³⁸³ During that month a reported 270 million persons participated in activities to clean streets and sidewalks, plant trees, clean away garbage and dredge rivers.³⁸⁴

The 1979 environmental legislation, the Decision of the State Council and the local regulations represent important steps toward environmental protection. How likely is it, however, that these laws, policies and regulations will achieve their stated objectives? In order to judge their potential effect on the protection of China's environment, it is again necessary to move beyond legislation and examine four areas which will have a strong impact on the state of China's environment and which will test the country's commitment to finding solutions.

A. Industrial Pollution

The Chinese face a number of obstacles in attempting to reduce the levels of industrial pollution resulting from the new economic policies. The first is the size of the problem. According to Beijing city officials, for example, 1.8 million tons of waste water alone are discharged annually in that city.³⁸⁵ Of this amount, forty percent is sewage while sixty percent is industrial waste.³⁸⁶ At the present time, waste water treatment plants can dispose of only eight percent of this amount.³⁸⁷ Although plans were announced in 1981 to build more waste water treatment centers,³⁸⁸ the Chinese have focused most of their attention on controlling industrial pollution at the source. This raises a second problem for the Chinese, which is one of cost. The laws and regulations passed since 1979 require factories and mines either to include acceptable pollution control devices in construction plans, to install them in existing plants or face fines if they do not or cannot meet prescribed standards.³⁸⁹ Although the costs and technology involved with these rules will make widespread compliance difficult, the Chinese have reported examples of the steps they have taken.

In August 1980 a letter was published in the *People's Daily* newspaper in Beijing demanding that construction of a pollution-causing cotton mill on the outskirts of the city be halted.³⁹⁰ The letter charged that the mill would spoil a scenic area of Beijing, would pollute the source of drinking water for two million people and would cause extensive noise and air pollution.³⁹¹ While there has been no report as to whether construction of the mill was halted, the newspaper

383. *National Socialist Ethics and Courtesy Month*, BEIJING REV., Mar. 8, 1982, at 5.

384. *Summing-Up of National Socialist Ethics Month*, BEIJING REV., May 24, 1982, at 7.

385. See *Beijing Works*, *supra* note 364, at R 1.

386. *Beijing to Fine Units*, *supra* note 365, at R 1.

387. *Beijing Works*, *supra* note 364, at R 1.

388. *Large Waste Water Treatment Plant Opens in Jilin*, Beijing Xinhua, Mar. 8, 1981, *reprinted in* FBIS-CHI-81-046, Mar. 10, 1981, at S 2.

389. *State Council Decision*, *supra* note 352, at L 2.

390. *Renmin Ribao Letter Demands No More Work on Polluting Mill*, Beijing Xinhua, Aug. 4, 1980, *reprinted in* FBIS-CHI-80-155, Aug. 8, 1980, at L 1.

391. *Id.* at L 2.

lent its editorial support to the demand to close it.³⁹² In November 1980 construction work on a chemical works project in Beijing was discontinued for pollution reasons.³⁹³

Even more expensive for the Chinese will be compliance with requirements that existing factories correct their pollution problems. However, in September 1980 the Chinese reported that in Beijing four factories had moved out of the city, forty others had merged and forty-three had switched to other forms of production.³⁹⁴ The Chinese have not indicated whether these figures are part of a nationwide trend or are only model factories such as those publicized during the Cultural Revolution. In addition, the Chinese have given no figures on the costs involved in halting, moving, merging or switching production.

Since most of China's 400,000 factories and mines³⁹⁵ are old and lack any form of pollution control devices,³⁹⁶ the alternatives presented by the Law on Environmental Protection and the Decision of the State Council place factories in a difficult position. Company managers must modify existing facilities at a considerable cost or move, merge or switch production which will also be expensive. Thus the Chinese have looked for less expensive and less technically sophisticated means to reduce pollution. One way has been to alter the methods of management and production in factories. According to the Chinese, for example, one third of all air pollution is caused by improper management techniques such as the failure to check and repair broken pipes.³⁹⁷

The Chinese have also blamed much of their industrial pollution problem on the location of factories.³⁹⁸ Since there is no such thing as zoning in China and since many factories are located in urban and residential areas, the government has urged better planning for residential, recreational, cultural and commercial areas.³⁹⁹ While this may reduce pollution in the future, it is not feasible to rearrange existing Chinese cities into specific use areas.

Finally, the Chinese have also publicized a number of cases of fines and jail sentences handed down by courts for industrial pollution. In October 1979 a court in Jiangsu Province sentenced a worker in a chemical plant to two years imprisonment for professional negligence for allowing liquid sodium cyanide to

392. *Id.*

393. *Renmin Ribao on Decision to Cancel Chemical Plant*, Beijing Xinhua, Nov. 19, 1980, reprinted in FBIS-CHI-80-226, Nov. 20, 1980, at L 32.

394. *Beijing Seeks Measures to Reduce Industrial Pollution*, Beijing Xinhua, Aug. 13, 1980, reprinted in FBIS-CHI-80-159, Aug. 14, 1980, at R 2.

395. *China to Intensify Environmental Protection*, 93 CHINA MED. J. 357.

396. *Id.*

397. *Xinhua Stresses Need of Pollution Control*, Beijing Xinhua, Feb. 10, 1981, reprinted in FBIS-CHI-81-028, Feb. 11, 1981, at L 28, L 29.

398. *Id.* at L 29.

399. *Renmin Ribao Discusses Tasks in Urban Planning*, Beijing Renmin Ribao, Oct. 17, 1980, reprinted in FBIS-CHI-80-220, Nov. 12, 1980, at L 23.

escape from a storage tank into nearby rivers and sewage systems.⁴⁰⁰ In November 1980 three factories in the city of Harbin were fined for polluting the Songhua River.⁴⁰¹

B. *Energy Alternatives*

The principal source of China's air pollution problems is the continued use of coal for industrial and domestic fuel.⁴⁰² While the Chinese recognize that coal will remain the primary source of energy for the foreseeable future, a number of alternatives are being explored.⁴⁰³

One source of energy that has attracted considerable interest in China is nuclear power. In 1981 a group of Chinese scientists proposed that a program to construct six nuclear power generating stations be undertaken as soon as possible.⁴⁰⁴ This statement came after the government had reached an agreement with France in late 1980 to purchase two complete sets of nuclear equipment and to cooperate on nuclear technology.⁴⁰⁵ The Chinese view nuclear energy as an important means of reducing the pollution from coal and, at the same time, providing much needed electricity.⁴⁰⁶ No attention has been paid by the government, however, to the threats to the environment posed by nuclear power. This has resulted in at least one strike by college students protesting the deaths of several students and teachers allegedly from radiation waste.⁴⁰⁷

In addition to nuclear power, the Chinese have sought to develop other alternative sources of energy. In January 1981 a national energy symposium held in Beijing proposed a multifaceted approach to tapping additional energy from sources such as petroleum, hydro-electric, biogas, natural gas, solar, geothermal, tidal and wind.⁴⁰⁸ Of these alternatives only petroleum and biogas are presently in widespread use.⁴⁰⁹

At the same time the Chinese have attempted to reduce air pollution through

400. *Court Sentences Chemical Factory Worker in Pollution Case*, Beijing Xinhua, Oct. 27, 1979, reprinted in FBIS-CHI-79-212, Oct. 31, 1979, at O 1.

401. *Three Factories in Northeast Fined for Pollution*, Beijing Xinhua, Nov. 14, 1980, reprinted in FBIS-CHI-80-220, Nov. 14, 1980, at S 1.

402. See Weil, *China's Troubled Coal Sector*, CHINA BUS. REV. Mar.-Apr. 1982, at 23.

403. See *id.*; Wen, *Use of New and Renewable Energy Resources in China*, BEIJING REV., Apr. 19, 1982, at 18.

404. *Scientists Urge Exploitation of Energy Resources*, Beijing Xinhua, Jan. 6, 1981, reprinted in FBIS-CHI-81-004, Jan. 7, 1981, at L 12 [hereinafter cited as *Scientists Urge Exploitation*].

405. *Id.*

406. See Rowley & Loong, *The Politics of Nuclear Power*, FAR EASTERN ECON. REV., Oct. 10, 1980, at 48.

407. AFP: *Sichuan Students Protest Against Radioactive Waste*, Paris AFP, Nov. 12, 1980, reprinted in FBIS-CHI-80-221, Nov. 13, 1980, at Q 3.

408. See *Scientists Urge Exploitation*, *supra* note 404, at L 12.

409. See *Good Prospects for Petroleum Resources*, BEIJING REV., Mar. 24, 1982, at 9; Van Buren, *Biogas Beyond China*, AMBIO, Jan. 1980, at 10; and Liu, *Now They're Cooking With Gas*, CHINA RECONSTRUCTS, Apr. 1981, at 40.

alternatives to coal, they have also pursued programs of energy efficiency.⁴¹⁰ The stated goal of these programs is energy conservation so that more coal and petroleum will be available for domestic use and foreign export.⁴¹¹ In particular, the Chinese have focused on making industry more efficient by replacing old boilers and furnaces, switching from coal to oil and reducing the consumption of coal.⁴¹² However, like the public health and resource management campaigns of the 1950's, these programs also have had important environmental benefits. As industry stops wasting coal and petroleum, not only is there more available for development projects but there is also a decrease in the amount of air pollution.

C. Land Use

A second environmental problem facing China results from the government's land use policies. At the present time, the Chinese must deal with soil erosion and soil exhaustion produced by the agricultural policies of the Cultural Revolution, the pressures of a growing population and current economic policies.

During the Cultural Revolution, Mao Zedong urged the peasants to "take grain as the key link" in agriculture.⁴¹³ The result was mass campaigns to plow up pasture land and forests and terrace mountains in order to plant grain crops.⁴¹⁴ As a result, topsoil was washed away so that one sixth of China's land now suffers from serious soil erosion.⁴¹⁵ In addition, as trees were cut down and grasslands cleared, silt was washed into rivers, raising the height of rivers and causing flooding.⁴¹⁶

A second factor in China's land problems has been the need for intensive agriculture. With only one tenth of the country's land cultivable,⁴¹⁷ there has been little room for expansion as the population has doubled. The Chinese have attempted to meet this problem by the more intensive use of existing land and the use of chemical fertilizers and insecticides.⁴¹⁸ Rather than solving the food problem, however, this has only polluted the soil, water and crops, further complicating the problem. In recent years, however, the Chinese have begun to

410. See *Shanghai's Suburban Factories to Operate at Night Only*, Shanghai City Service, July 19, 1980, reprinted in FBIS-CHI-80-143, July 23, 1980, at O 2; *Regional Management Conference Stresses Energy Conservation*, Beijing Xinhua, Aug. 6, 1980, reprinted in FBIS-CHI-80-154, Aug. 7, 1980, at S 1.

411. Taylor, *Energy Conservation*, CHINA BUS. REV., Jan./Feb. 1982, at 12, 13-14.

412. *Id.*

413. *China Worried by Loss of Grain Land*, N.Y. Times, Feb. 9, 1982, at 4, col. 3.

414. Butterfield, *Chinese Ecology Upset by Food Drive*, N.Y. Times, Apr. 7, 1980, at A12, Col. 1.

415. *Id.*

416. In July and August 1981 China suffered heavy flooding in Sichuan Province. The Chinese report that a major reason that the floods were so severe was that much of the trees and other vegetation in the area had been cut down thus causing the topsoil to be washed away. See *Lessons From Sichuan Flood*, CHINA RECONSTRUCTS, Dec. 1981, at 9.

417. *Composition of China's Land Resources*, *supra* note 33, at 27.

418. *Protecting the Environment*, CHINA RECONSTRUCTS, Feb. 1980, at 28, 29.

use biological controls such as beneficial insects, pathogenic microbes and ducks to control and eliminate plant diseases and pests.⁴¹⁹

Finally, some of China's current environmental policies may actually further contribute to the land problems. As mentioned earlier, in order to comply with the Law on Environmental Protection and the Decision of the State Council, some factories whose pollution cannot be prevented are being relocated in rural areas.⁴²⁰ This will not only increase air and water pollution in rural areas but will require that the factories be located on land that might otherwise be used for crop production. In order to deal with these problems, it was proposed in September 1980 that a new agrarian law be adopted which would place strict control over the use of farmland for industrial purposes.⁴²¹ Such a law, however, has not yet been adopted.

D. *Protection of Natural Resources*

Despite the problems confronting the Chinese in dealing with industrial pollution and land use, more attention has been paid to afforestation since 1979 than any other area of environmental protection. The result is that afforestation stands out as the one area of real environmental achievement for the Chinese during the past three years.

Despite efforts to increase China's total amount of forest area between 1949 and 1979,⁴²² the ratio of forest land has increased only slightly. This is due to a survival rate for the new planting which was often below ten percent.⁴²³ In order to increase the amount of forest land and implement the dictates of the Forestry Act and the March 1981 "Decision of the State Council on Forestry,"⁴²⁴ the National People's Congress adopted a resolution in December 1981 requiring all able-bodied Chinese over the age of eleven to plant three to five trees per year.⁴²⁵ While the Forestry Act states the ultimate goal of thirty percent of the country as forest covered area, the March 1981 resolution aimed at a specific target of raising China's forest area to twenty percent by the year 2000.

In keeping with the Forestry Act, the Chinese have relied both on administrative fiat and mass campaigns to carry out their forestry policies. At the provincial level, mass participation campaigns have been undertaken to construct "shelter-

419. *Biological Control of Insect Pests Raises Production*, China Daily, June 22, 1982, at 3, col. 5.

420. See text accompanying note 394 *supra*.

421. *Jiangsu NPC Deputies Suggest Need for New Agrarian Law*, Beijing Xinhua, Sept. 6, 1980, reprinted in FBIS-CHI-80-175, Sept. 8, 1980, at L 37.

422. See Alley, *On Trees and Erosion*, EASTERN HORIZON Sept. 1981, at 10.

423. Smil, *Degradation*, *supra* note 234, at 786. Several reasons are given for this low rate: careless planting, inadequate follow-up care and the lack of a scientific approach to afforestation. *Id.* at 785-86.

424. *CCP, State Council Make Decisions on Forestry*, Beijing Xinhua, Mar. 11, 1981, reprinted in FBIS-CHI-81-048, Mar. 12, 1981, at L 6.

425. *The Greening of China*, BEIJING REV., Mar. 22, 1982, at 5.

belts," while regulations have banned the indiscriminate cutting of trees.⁴²⁶ At the national level, it was reported that during the "National Socialist Ethics and Courtesy Month" of March 1982 4.1 billion trees were planted throughout the country.⁴²⁷

While afforestation has been a major success for the Chinese since 1979, the destruction of national relics and historical sites has produced a setback in efforts to protect natural resources. Both the Law on Environmental Protection and the Decision of the State Council include "places of historical and scenic interest" in the definition of environment.⁴²⁸ In March 1982 the State Council designated twenty-four cities as "important urban and cultural sites" in an effort to increase the legal protection of historical and cultural sites in those cities.⁴²⁹ Such a designation means that consideration for historical and cultural value must be given in future city planning.⁴³⁰ In addition, the designation assigns specific time periods for factories in those cities to reduce their pollution.⁴³¹ Despite the legal steps taken to protect cultural and historical sites, however, more than one thousand such sites and tombs have been destroyed during the past three years in the drive for economic development and construction.⁴³² According to Chinese officials, one reason is that the regulations on preserving cultural sites are difficult to enforce.⁴³³

The factors that have contributed to the success of China's afforestation policies and the inability to enforce the cultural and historical site regulations are examples of the broader problems that confront the Chinese as they attempt to implement the new environmental laws and regulations. First, as was discussed at the beginning of this article, while the Chinese respect nature in the abstract, the pressures of economic conditions have often dictated that they take actions which have a detrimental effect on the environment. Although the 1979 environmental laws and subsequent regulations are a modern expression of this respect for the environment, their application must take place within the reality of the country's programs for modernization and construction. Thus, only when

426. See *Afforestation Resolution Adopted*, Harbin Heilong-jiang Provincial Service, July 5, 1980, reprinted in FBIS-CHI-80-138, July 16, 1980, at S 1; *Lianoning Tree Planting*, Beijing Xinhua, July 16, 1980, reprinted in FBIS-CHI-80-140, July 18, 1980, at S 6; *Hebei Afforestation*, Beijing Xinhua, July 11, 1980, reprinted in FBIS-CHI-80-140, July 18, 1980, at R 1; *Sichuan Forestry*, Beijing Domestic Service, Oct. 20, 1980, reprinted in FBIS-CHI-80-207, Oct. 23, 1980, at Q 1; *Jiangxi Meeting Acts to Halt Forests' Destruction*, Nanchang Jiangxi Provincial Service, Oct. 31, 1980, reprinted in FBIS-CHI-80-214, Nov. 3, 1980, at O 1; and *Guizhou Urges Forest Protection, Price Controls*, Guiyang Guizhou Provincial Service, Jan. 13, 1981, reprinted in FBIS-CHI-81-009, Jan. 14, 1981, at Q 1.

427. *Drive to Turn China Green*, BEIJING REV., May 31, 1982, at 6.

428. See Law on Environmental Protection, *supra* note 9, art. 3.

429. *Government Moves to Protect Historical Sites*, BEIJING REV., Mar. 15, 1982, at 8.

430. *Id.*

431. *Id.*

432. *Id.* *China Relics Being Lost to Vandalism, Building Projects*, L.A. Times, June 16, 1982, at 1-A1, col. 3.

433. *Id.*

the environmental laws and regulations do not conflict with state economic policies will there be a real chance for environmental protection and improvement. Since 1979, the goals of reducing industrial pollution, better land use and the protection of national relics and historical sites have forced the Chinese to choose among government policies and thus have met with mixed results. Afforestation, on the other hand, has not forced the Chinese to balance or choose between the environment and economic goals, and therefore has been a success.

Second, there are serious financial and technical limitations on the ability of the Chinese to carry out fully their obligations under the laws in the near future. These limitations include insufficient technical knowledge about the effects of environmental control equipment. Unlike the goal of reducing industrial pollution, afforestation does not require new technology or the moving of existing factories. Instead, it can be carried out by "voluntary" mass campaigns which have been an integral part of all China's past successes.

VI. CONCLUSION

China's approach to environmental matters since 1949 has been a reflection of the country's broader policies. Until the late 1960's, no mention was made of the need for environmental protection. In part, this was because China was an agricultural society which did not produce the types of industrial pollution which have been a concern to the West. Instead, the country focused on improving public health and managing its scarce natural resources. Both of these policies produced important environmental benefits. At the same time, however, China undertook an ambitious program of economic development which produced serious social and environmental problems.

During the Cultural Revolution, the environment, like everything else in China, became a political issue for domestic and international purposes. While the Chinese began to admit that they had environmental problems, they used pollution as another factor in the attack on the policies of Liu Shaoqi. Programs designed to promote environmental protection and claims of their success were attributed to the wisdom of Mao Zedong's political ideology.

Two important developments since the death of Mao and the end of the Cultural Revolution have affected the environment in China. First, the Chinese have taken a more realistic attitude toward the condition of their environment. They now admit that the policies and programs of Liu and Mao were unable to deal adequately with pollution. In addition, the country has moved slowly toward the adoption of a formal legal system. These two changes have resulted in the enactment of both national environmental laws to serve as overall policy statements and local regulations to implement these goals. These new policies, however, have been formulated at the same time that the Chinese have embarked on a program of "four modernizations" with its emphasis on rapid economic growth. Since China lacks the technology and financial ability to include sophisti-

cated pollution control devices in its factories, the potential for conflict between the environment and industry has been created. In addition, the lack of an alternative energy source to coal and the increasing pressures on land brought about by a growing population will make the attainment of environmental goals difficult.

The next few years will test the Chinese commitment both to environmental protection and to legislation as a means of implementing public policy. If the Chinese are able to halt the decline in their environmental quality and also make some noticeable improvement, it will be a victory both for the environment and for the legal system.